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A Bacteriological Study of Select Natural Bathing Beaches at Missouri Lakes and/or Reservoirs

Fred G. Unnewehr, R.S., Coordinator, General Sanitation, Bureau of Community Sanitation

Introduction

As bacteriological records of natural bathing places in Missouri were sparce, the Department of Health (DOH) collecting data at U.S. Army Corps of Engineer lakes and the Lake of the Ozarks during the 1989 swimming season. Spot sampling of Missouri recreational lakes and streams have taken place in the past, prompted by curiosity or concern over the isolated occurrence of human gastroenteritis cases not attributable to food or drinking water.

Certain Little Rock and St. Louis District U.S. Army Corps of Engineer lakes (Table Rock, Bull Shoals, Clearwater and Wappapello) in the southern part of the state have maintained a bacteriological sampling program for the past several years on a monthly or bi-monthly basis. On the other hand, relatively new Corps lakes in the Kansas City District (Stockton, Pomme de Terre, Truman, Smithville and Long Branch) had very little, sampling records.

The sampling period was set up on a weekly basis to cover the 14-week period between Memorial Day and Labor Day weekends.

Scope

Selection of sampling sites was made from a total of 57 beaches located at 11 lakes. A total of 17 beaches made up the sampling size. Selection was made at random and the number was based on the following formula: 25% of the swimming beaches at each lake, or at least one swimming beach at each lake, whichever was greater.

Site Selection

Kansas City Corps District
 # Sites
2 - Harry S. Truman (Thibaut Point-Windsor Crossing)
1 - Pomme de Terre (Hermitage Area State Park)
1 - Long Branch (Bloomington Area)
1 - Smithville (Camp Branch)
2 - Stockton (Ruark Bluff-Orleans Trail)

Little Rock Corps District
 # Sites
1 - Bull Shoals (Beaver Creek)
1 - Clearwater (Highway K)
5 - Tablerock (Aunts Creek-Big M-Hwy.)
13-Mill Creek-(Resident's Office Complex)

St. Louis Corps District
 # Sites
1 - Wappapello (Peoples Creek)
1 - Mark Twain (John F. Spalding)

Lake of the Ozarks
 # Sites
1 - Public Beach #2

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Sampling Procedures

Samples (with the exception of Lake of the Ozarks) were collected and submitted by U.S. Army Corps of Engineer Project Managers or designees assigned to the selected Corps managed lakes. Samples from Lake of the Ozarks were collected by DOH Central District Health Office personnel. Bureau of Community Sanitation staff members coordinated the study, conducted sanitary surveys (when bacteriological samples exceeded standards), and recorded results of the sampling effort.

Local health department personnel collected ***check samples*** monthly at the sampling sites. Samples were collected within one foot of the surface of the water having a depth range of three to six feet. The sample bottle was grasped at the bottom and slowly plunged into the water through a 45° arch within the one foot depth range and back to the surface filling the bottle.

One set of samples (collected during any one day) was collected from representative locations throughout the bathing area. This normally consisted of two samples, but warranted additional samples under certain circumstances. Samples were collected only when the beach was open and in use (preferably during high bather load). One control sample from a like area within a one mile radius was collected, avoiding marinas and other impacted areas.

During this study, approximately 382 un-iced samples were mailed after collection with first class postage or hand delivered to the health laboratory within 48 hours after collection. This is the established procedure utlilized by DOH for bathing beach, swimming pool and potable water supply mail-in samples.

Bacteriological Standards

The standard (1975 GLUMR Board Ten State Standards Committee on bathing beaches) was as follows:

- The fecal coliform density from the last five successive sample sets collected on five different days should not exceed a geometric mean of 200 per 100 Ml.
- Fecal coliform density from any one sample should not exceed 1000/100 Ml.

Additional Data

The U.S. Army Corps of Engineers project offices and Union Electric (Lake of the Ozarks) routinely record the following data weekly via a form provided to the party collecting samples:

1. Precipitation since last sample
2. Lake level
3. Water temperature
4. Wind velocity and direction
5. Water clarity
6. Number of bathers

Results and Discussion

Although there is data missing in this study due to failure to send in all weekly samples and data sheets, there is a definite pattern of higher fecal coliform counts at the beaches, coinciding immediately after rainfalls of one inch or more.

Of the samples collected, 85 percent met the fecal coliform standard of <200/100 Ml. Fecal coliform were sporadically high at lakes that had resident Canada Goose populations. Beach water contamination normally results from bathers feeding the geese after they are encouraged and/or enticed to enter the beach area. Fecal deposits build up and are washed into the water during moderate to heavy rains.

Some of the beaches are located in coves which are fed by wet weather streams. Local heavy rains carry sediments, organic materials, and other point source contamination into the beach areas from miles away in some instances.

Short intermittent periods following heavy rainfall and waterfowl populations appeared to be the most ***apparent*** factors affecting water quality. Bather load probably played a part, in that sediments and other contaminants are stirred up from the bottom during high bather use as evidenced by control sample results.

From a bacteriological standpoint the beaches in this study fared quite well. As previously mentioned, 85 percent of the samples were in compliance with the *Great Lakes Upper Mississippi River (GLUMR) Boards 1975 Standard for Bathing Beaches.* There were four beaches that complied 100 percent with the <200 fecal coliform/100 Ml.

Precipitation during the 1989 summer was above normal in most areas of the state. Data taken from samples during a hot, dry summer and low lake level might prove to be quite different.

It is recommended that the public be discouraged from feeding waterfowl in beach areas and beaches be closed for safety considerations during periods of high turbidity (six inch black disc on a white field should be readily visible at a depth of four feet).

Future studies should be limited to beaches at a typical lake and be more in-depth to include monitoring beach sand, temperatures, sediments, water currents, shoreline groundwater, etc. In addition, multiple daily samples may be of significance, i.e., windy in the morning and calm in late afternoon, or vice-versa.

Conclusions and Recommendations

Data from this study suggests that beach areas located in coves where watershed sources of contamination are difficult to control (due to large areas involved) are prone to periods of elevated counts of fecal coliform (>200) after heavy rains and resultant turbidity encroachment into the beach areas. Beaches with resident populations of Canadian geese were subjected to immediate contamination as droppings from the beach were washed into the water after rains producing runoff. Of less significance in adding to increased levels of fecal coliform was the turbidity stirred up by bathers and wave action in the shallow-water portions of the beach areas. ■

Editor's Note:

Beginning with this issue, a new section has been added which will feature State Public Health Laboratory news. Please check future newsletters for noteworthy laboratory news and positive laboratory findings of special interest.

State Public Health Laboratory Report

James Baumgartner, BS, MBA, Chief, Metabolic Disease Unit

The Metabolic Disease Unit, State Public Health Laboratory (SPHL), tests specimens in support of Department of Health programs which screen newborns for certain metabolic/genetic abnormalities. Currently, the programs screen for phenylketonuria (PKU), hypothyroidism, galactosemia, and hemoglobinopathies. Blood specimens are submitted on Schleicher & Schuell #903 collection (filter) paper. Specimens are usually obtained before the infant is discharged from the hospital of birth.

In 1989, 79,291 initial specimens were received and tested by the SPHL. The provisional number of live births in Missouri reported to the State Center for Health Statistics is 76,500.[1] The additional specimens, in many instances, were collected from infants transferred after birth to hospitals in Missouri. Also submitted were 15,162 repeat specimens.

The SPHL uses a bacterial inhibition assay for PKU. Phenylaline levels are reported in the following manner:

NORMAL	: less than 4 mg/dl
BORDERLINE	: 4 - 5 "
PRESUMPTIVE POSITIVE	: 6 and above "

In 1989, two specimens were reported as PRESUMPTIVE POSITIVE and 149 as BORDERLINE.

For hypothyroidism screening, the Laboratory uses a radioimmunoassay (RIA) for thyroxin (T4) as the primary test. A secondary test for thyroid stimulating hormone (TSH) is employed and specimens are reported as follows:

NORMAL	: less than 25 IU/ml TSH
BORDERLINE	: 25 - 49 " "
PRESUMPTIVE POSITIVE	: 50 and above " "

Of the initial specimens, 43 were reported as PRESUMPTIVE POSITIVE and 728 as BORDERLINE.

Galactosemia screening uses a qualitative test for the enzyme, galactose-1-phosphate uridyl transferase. Specimens with abnormal transferase results are further tested for accumulations of the milk-sugars, galactose and galactose-1-phosphate. These results are reported in the following manner:

BORDERLINE	: less than 600 uMol/l Galactose
PRESUMPTIVE POSITIVE	: 600 and above " "

Of the initial specimens tested in 1989, 23 were reported as PRESUMPTIVE POSITIVE and 482 as BORDERLINE.

Screening for hemoglobinopathies on newborn specimens was initiated in May, 1989 using Isoelectricfocusing (IEF) methodology. 54,338 initial specimens were tested and the following abnormal hemoglobins reported:

FAS	(Sickle cell trait)	: 641
FAC	(Hb C trait)	: 178
FAX	(Hb variant)	: 143
FS	(Sickle cell disease)	: 30
FSC	(SC disease)	: 17
FC	(Hb C disease)	: 4

■

Reference:

1. Birth registry, State Center for Health Statistics, 2-8-90.

1989-90 Influenza Update

The 1989-90 influenza season was off to an early start with the first laboratory confirmed case reported during the week ending December 2, 1989. During the 1988-89 flu season, the first isolate was not reported until the first week in 1989.

As of February 10, 1990, there had been 220 influenza isolates reported in Missouri. All isolates are Type A and131 have been subtyped as H3N2 (Shanghai-like). There have been no isolates of Influenza A (H1N1) or Influenza B in Missouri. *Figure 1* indicates the number of influenza virus isolates by report week.

The 638 active surveillance sites continue to report increased incidence of influenza-like illness. There have been reports of influenza-like illness outbreaks in long-term care facilities. *Figure 2* compares the number of influenza-like illnesses for the 1989-90 season to an average of the three previous flu seasons.

Pneumonia and influenza (P&I) deaths are used to track the impact of influenza. *Figure 3* illustrates P&I deaths for this season and for an average of the previous six seasons.

Additional information may be obtained through your local and district health office or by calling the ***Bureau of Communicable Disease Control at 800/392-0272.*** ■

Figure 1

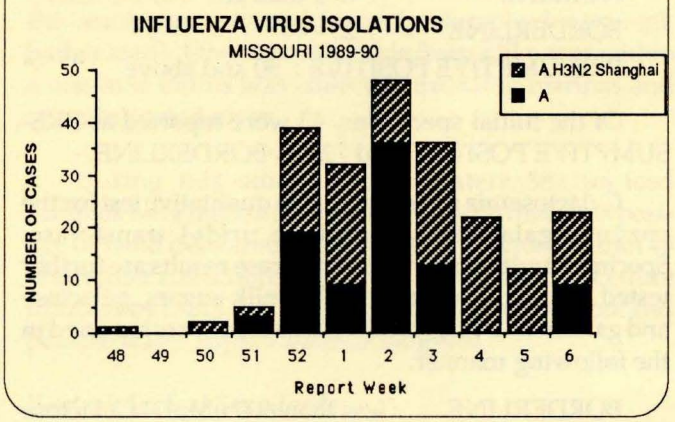


Figure 2

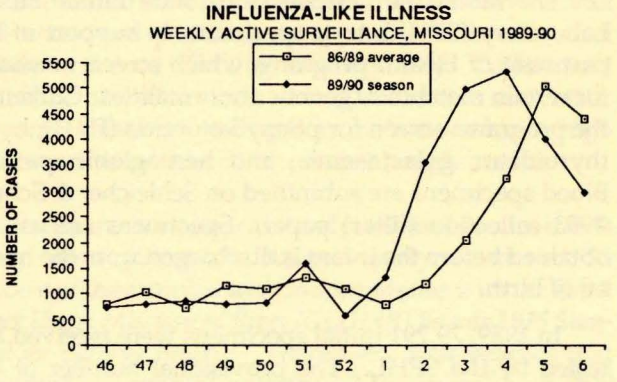
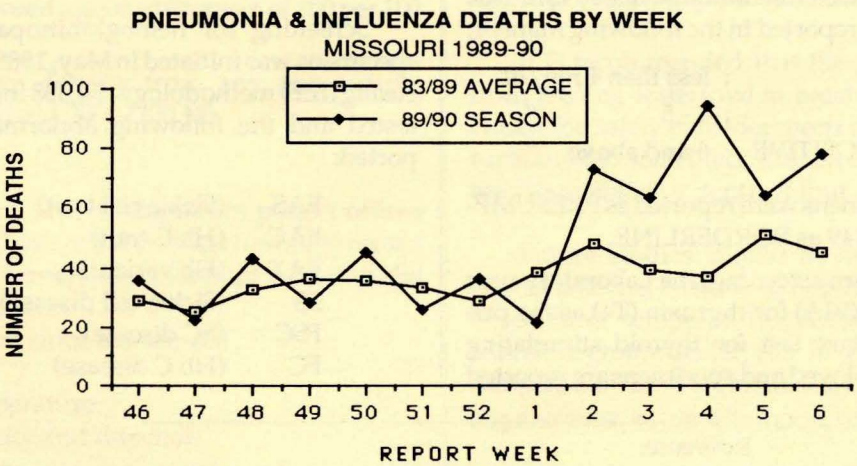


Figure 3



Eosinophilia-Myalgia Syndrome (EMS) Associated with Ingestion of L-Tryptophan-Containing Products

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The Centers for Disease Control (CDC) have recently received a number of case reports from physicians and state health departments regarding the possible association of ingestion of tablets or capsules containing L-tryptophan and a clinical syndrome whose hallmark appears to be intense eosinophilia (generally at least 2,000 eosinophils/cu mm but with counts as high as 30,000). Most patients present with myalgia that is usually very severe. Less consistent features of the illness include an initial respiratory prodrome of cough, dyspnea, or pulmonary infiltrates; arthralgias; edema of the limbs; sclerodermiform skin thickening; neuropathy (mononeuritis multiplex); evanescent skin rash; mildly elevated transaminase levels; and leukocytosis. The vast majority of these patients report having taken L-tryptophan during a period of days to weeks prior to the onset of symptoms.

L-tryptophan is an essential amino-acid that is normally ingested as a constituent of dietary protein, but some persons use over-the-counter preparations as a nutritional supplement or for disorders such as insomnia, depression, and premenstrual syndrome. Based on what is currently known about the potential for risk with L-tryptophan, the Food and Drug Administration (FDA) has asked for withdrawal from the market of all over-the-counter L-tryptophan dietary supplements that provide for the intake of 100 mg or more daily. The withdrawal has not at this time been extended to dietary products that, following the label instructions, deliver a daily dose of less than 100 mg of L-tryptophan. The FDA is continuing to evaluate the safety of those products and will take further actions as appropriate.

None of the cases of EMS reported to CDC have involved infant, parenteral or enteral formulas, but the sources of L-tryptophan in these products may be the same as those in over-the-counter dietary supplements that have been associated with EMS. The physician must consider the essential need of each patient for the product balanced against the potential risk.

For the purposes of surveillance, the CDC has defined the eosinophilia-myalgia syndrome as an illness satisfying the following three criteria:

1) An eosinophil count > 1,000 cells/cu mm
2) Generalized myalgia (at some point in the course of the illness) of severity sufficient to affect the patient's ability to pursue daily activities
3) Absence of any infection or neoplasm that could account for the eosinophilia or myalgia. Listed below are conditions that would exclude the diagnosis of EMS and possible diagnoses that these patients may have received in the past that would not rule out the diagnosis of EMS.

The only clearly indicated step in the management of patients with EMS is discontinuation of L-tryptophan. There are reports of patients treated with glucocorticoids with some benefit, but results have been seldom dramatic. The decision to treat with glucocorticoids must be made on an individual basis according to the judgement of the attending physician. The optimal dosage and duration of glucocorticoid therapy is not known.

Twenty-seven cases have been confirmed in Missouri residents as of February 9, 1990. Nationwide, 1269 cases were reported through February 9, 1990. At least 13 deaths have been reported in patients taking L-tryptophan who subsequently developed EMS. Most individuals diagnosed with EMS have had onset of illness since the beginning of summer,1989; however, cases have been reported with onset as far back as three years ago. Your assistance is requested in identifying and reporting cases in Missouri residents which meet the above surveillance definition, including those with onset prior to the summer of 1989. ■

Conditions that exclude the diagnosis of EMS

-Trichinosis
-Schistosomiasis
-Filariasis
-Strongyloidiasis
-Any other parasitic infestation associated with eosinophilia
-Aspergillosis
-Coccidiomycosis
-Any other fungal infection associated with eosinophilia
-Sarcoidosis
-Wegener's granulomatosis
-End-stage renal disease
-Acute or chronic leukemia
-Drug reactions involving: Aspirin, Chlorpromazine, Iodine containing agents, Sulfa Drugs
-Polymyositis
-Dermatomyositis

Conditions that do NOT exclude the diagnosis of EMS

-Loffler's syndrome
-Polyarteritis nodosa
-Hypereosinophilic syndrome
-Eosinophilic fasciitis
-Eosinophilic gastroenteritis
-Allergic angiitis
-Pulmonary infiltrates with eosinophilia
-Any drug reaction other than those listed in the "conditions that exclude" column

Please report cases to the Bureau of Communicable Disease Control 800/392-0272

TB Awareness Fortnight
April 22 - May 5, 1990

Vic Tomlinson, Chief, Bureau of Tuberculosis Control

As an activity to remind the public and the medical community that tuberculosis has not disappeared and still remains a major health concern among some populations in the state, an awareness campaign is scheduled during the two weeks of April 22 - May 5, 1990. This campaign is being jointly sponsored by:

Missouri Department of Health
American Lung Association constituents of Eastern and Western Missouri
Missouri Thoracic Society
Missouri Residential Care Association
St. Louis Metropolitan Medical Society
St. Louis City Department of Health and Hospitals
St. Louis County Department of Community Health and Medical Care
Association for Practitioners in Infection Control
Kansas City and Jackson County Health Departments
University of Missouri - Kansas City School of Medicine/Truman Medical Center
Marion Merrell Dow Pharmaceutical Company

Some of the activities during this campaign will include grand rounds presentations on tuberculosis for medical students at Missouri medical schools and hospitals, feature articles in a number of newspapers, journals, and newsletters, and health fairs featuring tuberculosis awareness projects sponsored by various hospitals and clinics throughout the state.

The awareness activities in the St. Louis area will be highlighted with a symposium on tuberculosis featuring Dr. Lee Reichman, Director of the Pulmonary Division, University Hospital, in Newark, New Jersey. Dr. Reichman will be the keynote speaker at a symposium held at the St. Louis Metropolitan Medical Society on May 3, 1990. In his presentation, Dr. Reichman will be discussing the association between tuberculosis and human immunodeficiency virus (HIV) infections.

In Kansas City, Dr. Reichman will present grand rounds on tuberculosis on May 4 at St. Luke's Hospital and at the University of Missouri-Kansas City School of Medicine. In addition, nursing workshops will be held in Kansas City on May 4.

For additional information concerning the symposium or other TB Awareness Fortnight activities, contact the Bureau of Tuberculosis Control (314)751-6122. ■

Vic Tomlinson begins duties as Chief, Bureau of Tuberculosis Control

Vic joins the Missouri Department of Health as Chief of the Bureau of Tuberculosis Control after working in various health programs including tuberculosis, sexually transmitted diseases, and immunization. He is an employee of the Centers for Disease Control who is assigned to the state.

"I am very pleased to be in Missouri and to have the opportunity to work toward the elimination of tuberculosis in this state."

Although Vic is a native of Virginia, he has worked in Washington, D.C., Baltimore, Boston, and Philadelphia. When asked about his venture this far west, Vic said, "I am very pleased to be in Missouri and to have the opportunity to work toward the elimination of tuberculosis in this state."

Vic received a Bachelor of Arts degree from the University of Richmond in Richmond, Virginia and a Master of Public Administration from Penn State University in University Park, Pennsylvania.

As Bureau Chief, Vic will oversee the surveillance, containment, management, and assessment of tuberculosis. In addition, he is responsible for coordinating the Refugee Health Assessment Program. Vic says the key to success is "people" and he has excellent Bureau staff to assist with program activities. He looks forward to working with the public and private sectors to eliminate a disease which is still a major concern among many population groups. ■

Enactment of the Day Care Immunization Law: Common Problems of the Operator and Physician

Dr. Denny Donnell, Manager, Section of Disease Prevention
Bert Malone and Lisa Speissegger, Bureau of Immunization

In November 1989, the first step in the enactment of Missouri's Day Care Law (RsMo 210.003) was taken by the Bureau of Immunization. At that time, a packet of information and reporting forms was sent to 3000 day care operators in Missouri. This packet was created to assist the operator in providing information to the state regarding immunization levels in children less than five years old. This important information will help to direct resources to this underserved population. Included below are some commonly asked questions regarding the Day Care Immunization Law:

What are the required levels of immunization for these children?

The vaccine preventable diseases that children should be immunized against are measles, mumps, rubella, diphtheria, tetanus, pertussis, polio, and *Haemophilus influenzae b*. Some vaccines are administered as a single antigen and some are combined with others. These vaccines are abbreviated as follows: MMR (measles, mumps, and rubella), DTP (diphtheria, tetanus, and pertussis), OPV (polio), and HbCV (*Haemophilus influenzae b*). **The Missouri immunization schedule is:**

Recommended Age	Vaccines
2 mos.	DTP #1, OPV #1
4 mos.	DTP #2, OPV #2
6 mos.	DTP #3
15 mos.	MMR, DTP #4, OPV #3
18 mos.	HbCV
4-6 yrs.	DTP #5, OPV #4
14-16 yrs.	Td

A day care facility is required to ensure that all attendees have age appropriate immunizations. DTP #5 and OPV #4 are to be administered between ages four and six.

Should my child be immunized with Haemophilus influenzae b (HbCV) Vaccine?

Haemophilus influenza b is a major cause of meningitis, otitis media, epiglottitis, septic arthritis, acute febrile bacteremia, cellulitis, pneumonia, and empyema in infants and young children (3 months to 4 years old). The American Academy of Pediatrics and the CDC's Immunization Practices Advisory Committee consider children attending day care centers to be at high risk for *Haemophilus influenzae b*. Due to this increased risk of morbidity and mortality, the vaccine is critical in terms of protecting those five years of age and younger.

"My child is 4 years and 6 months. Why should he get immunized for Haemophilus influenzae b?"

About one in every 200 children in the United States will have a moderate to severe disease caused by *Haemophilus influenzae b* (Hib) before their fifth birthday. Approximately 35 - 40 percent of Hib cases occur among children 18 months of age or older, and 25 percent occur above 24 months of age.[1] Because children can carry this bacteria without having symptoms, and because a day care facility with 10 or more children offers a greater opportunity for exposure to this disease, parents with children under age five who attend a day care facility should consider strongly the importance of this vaccine. The current vaccine has a much improved efficacy over the polysaccharide vaccine introduced in 1985. The Hib Conjugate Vaccine (HbCV) currently produced has been shown to create protective antibody levels in 90% of those studied.[2]

Children who received Hib Polysaccharide Vaccine (the forerunner of HbCV) at 24 months of age and older do not need to be revaccinated with HbCV. However, children vaccinated with Hib Polysaccharide Vaccine before 24 months should be revaccinated with HbCV.

The day care law is a critical element in the avoidance of vaccine-preventable disease and death in Missouri's children. The Department of Health intends to work cooperatively with center operators, parents and physicians to accomplish this important task.

For children who have not received immunizations at the appropriate age, there is an alternate immunization schedule to follow. Please call you local health department or the Bureau of Immunization (314)751-6133) for more information. ■

[1]ACIP Recommendations, MMWR, April 19, 1985, Vol. 34, No. 15, Pages 201-205.
[2]ACIP Recommendations, MMWR, Jan. 22, 1988, Vol. 37, No. 2, Pages 13-16.

Foodborne illnesses cost $4.8 billion in 1987

USDA economist Tanya Roberts, in what she describes as the "first approximation of human illness costs for specific bacteria contaminating the US food supply," estimated the costs of foodborne illness caused by bacteria in 1987 at $4.8 billion. Ms. Roberts revealed this information in the May 1989 edition of the *American Journal of Agricultural Economics.*

Using published estimates for medical costs and productivity losses associated with *Salmonella* and *Listeria,* Ms. Roberts extrapolated costs for other specific bacteria, using epidemiologic data on incidence and severity.

"The most costly foodborne bacterial pathogens are *Campylobacter, Salmonella,* and *Staphylococcus,*" Ms. Roberts concluded in her study, noting that *Campylobacter* and *Salmonella* "generally enter the food chain in animal production, while *Staphylococcus* usually comes from worker contamination during processing, preparation, and packaging."

The study also estimated the annual number of cases and the total cost of other bacteria pathogens, including *Bacillus cereus, Escherichia coli,* and *Vibrio.* ■

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Pertussis in Missouri

Beverley Payne, State Public Health Laboratory
Bernard Malone, Bureau of Immunizations

Background

Pertussis, commonly referred to as whooping cough, is an acute bacterial disease involving the respiratory tract. The initial stage has an insidious onset with an irritating cough which gradually becomes paroxysmal, usually within one or two weeks. These paroxysms are characterized by repeated violent coughs without intervening inhalation. The cough is often followed by a characteristic high-pitched whoop upon inspiration. The paroxysm often ends with the expulsion of clear mucus. Young infants and adults often do not have the typical whoop. Mortality due to pertussis is rare in the U.S., but can be extremely high in un-immunized populations, particularly those with underlying malnutrition and multiple infections. The disease is transmitted primarily by direct contact with discharges from respiratory mucus membranes of infected persons by the airborne route, probably by droplets. The incubation period is commonly seven days, almost uniformly within 10 days, and not exceeding 21 days. Individuals with pertussis are highly communicable in the early stage before the paroxysmal cough stage. Thereafter, communicability gradually decreases and becomes negligible for ordinary non-familial contacts within three weeks, despite the presence of spasmodic cough with whoop. After initiation of effective antimicrobial therapy, usually erythromycin, the period of infectiousness is five to seven days.

During 1989, Missouri experienced a significant increase in the number of reported cases of pertussis. A total of 141 Missouri residents were reported as having pertussis. This is an increase over the previous five years during which there were an average of 32 cases per year. The increase is likely due to a variety of causes including outbreaks in the metropolitan areas of the state as well as increased laboratory surveillance for this condition. Pertussis cases have occurred throughout the state, with 36 counties reporting cases (Figure 1). The highest number of cases were reported in the metropolitan areas of Kansas City and St. Louis. The age-specific incidence was highest among children < one year of age and declined with increasing age (Figure 2).

Case Definition

The clinical case definitions used by the Bureau of Immunization are used and approved by the Council of State and Territorial Epidemiologists (CSTE) for uniform reporting of outbreak-related and sporadic pertussis cases:

- In an outbreak, a cough illness lasting ≥ 14 days is considered a case.
- A sporadic case includes this criterion and paroxysms, whoop, or post-tussive vomiting.

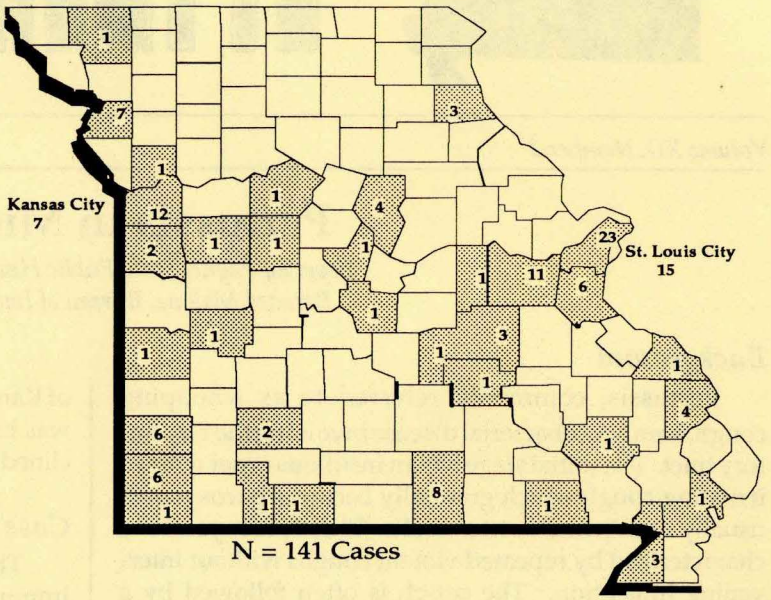
Inside this issue....

Submission of Specimens

One of the major challenges to an effective disease control program is the accurate identification of suspect cases and the appropriate testing of clinical specimens taken from these patients. The following information is included in order to provide adequate guidance to clinicians and other health care providers in the collection, handling, and submission of specimens for microbiological testing.

In 1989 the State Public Health Laboratory (SPHL) received 1175 specimens for *Bordetella pertussis*. One hundred sixty-four of these were positive by direct fluorescent antibody (DFA), culture or both. This was 4.5 times the number of positives from the average of the three previous years (Figure 4). The following table summarizes the results of bacteriologic testing since 1986:

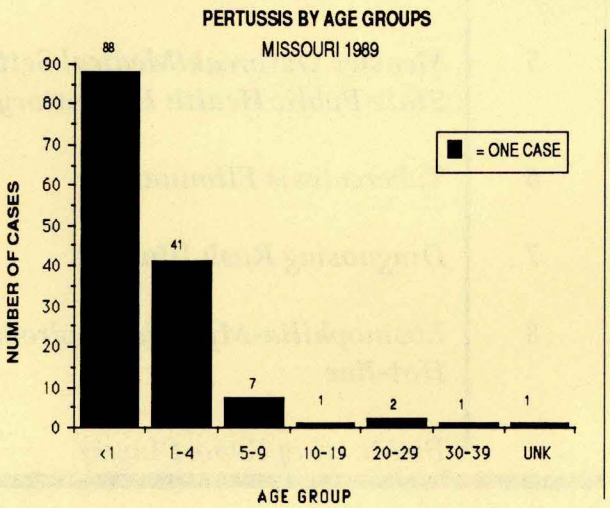
Figure 1
Pertussis Cases by County
1989

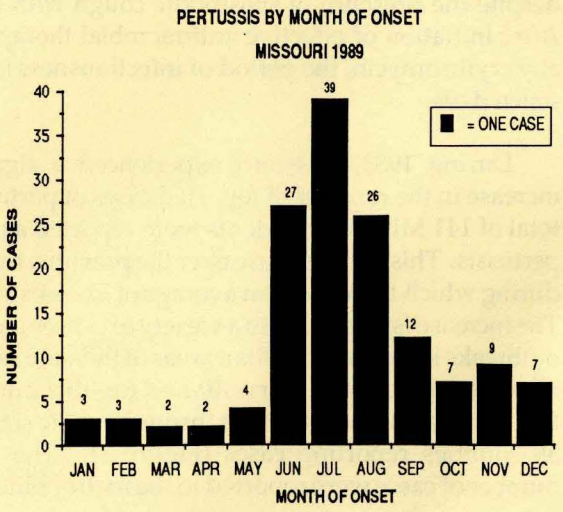


Year	*# Specimens*	*# Positive*	*% Positive*
1986	618	37	6
1987	609	43	7
1988	524	27	5
1989	1175	164	14

Because of the fastidious nature of the causative organism, *Bordetella pertussis*, there is no "gold standard" laboratory test at the present time. Due to inherent limitations in the tests, physicians must interpret both DFA and culture results in conjunction with symptoms to establish the diagnosis.

Figure 2





Direct Fluorescent Antibody (DFA)

The DFA is the most rapid laboratory procedure available but is low in sensitivity and specificity and the results are only presumptive. The DFA should only be used with symptomatic patients who require a rapid procedure for treatment decisions. It should not be used for asymptomatic contacts. The DFA only has clinical significance if it is positive and very little value if it is negative. Slides for DFA should ***always*** be accompanied by a specimen for culture.

In the experience of the Missouri State Public Health Laboratory during 1989, when comparing DFA to culture, the DFA had a sensitivity of 60 percent, a specificity of 95 percent, a positive predictive value of 54 percent, and a negative predictive value of 96 percent. Because culture is not an ideal "gold standard" and to minimize the measure of agreement over and above chance using a single statistic, the Kappa Statistic (k) is used. In 1989, this statistic was 0.52 when DFA was compared to culture. This demonstrates moderate agreement. The standard agreement ranges for use with k are:

0 - 0.39	indicates poor agreement
0.4 - 0.74	indicates moderate agreement
0.75 - 1.0	indicates excellent agreement

Culture

B. pertussis is an exquisitely sensitive organism, and successful culture is influenced by a wide variety of factors. In one evaluation, DFA and culture results of 150 patients were compared to a clinical case definition of > 14 days cough, whoop, spasms and vomiting. While 51 of the 53 patients with positive laboratory results met the clinical case definition, so did 62 of the 97 laboratory negative patients. Factors which influence the success of culturing efforts include:

1) Type of specimen - two nasopharyngeal swabs should be taken according to directions provided in the collection kit. Cough plates are no longer considered a proper specimen and aspirates, while acceptable, are difficult to collect outside a hospital setting.

2) Timing of specimen collection - specimens taken within 21 days of onset have over twice the chance of being positive as do specimens taken after 21 days. Specimens taken within the first six days have a four times greater chance of being positive.

3) Type of swab - calcium alginate (provided in kit) is the swab of choice. Dacron is less acceptable swab while all other swab materials are unacceptable.

4) Transport to the laboratory:

   a. Transport media - the only acceptable media is the Regan-Lowe (RL) transport media provided in the kit. All other transport media will not consistently maintain viability of *B. pertussis.*

   b. Temperature - nasopharyngeal swabs in RL transport media must be maintained at 4° C during transit for best results and to minimize overgrowth by contaminants.

   c. Time - extended time in transit will directly reduce recovery of *B. pertussis*. The SPHL recommends specimens be sent by 24 hour delivery for optimum results.

5) Prior antibiotic use - culture should be taken before administration of erythromycin. Cultures taken prior to the administration of erythromycin/septra have a five times greater chance of being positive.

Summary

Taking into account these laboratory realities, it is apparent that physicians must interpret laboratory results, especially negative results, in light of the clinical picture. Epidemic whooping cough is more easily recognized because of the large numbers of typical cases that occur in children. Once laboratory confirmation is received on a few of these cases, public health authorities and physicians may establish rapid intervention. Endemic whooping cough, on the other hand, presents an entirely different diagnostic and management challenge. Single sporadic cases are more difficult to confirm by present day laboratory procedures. Presentation of symptomatology may also be less clear due to atypical cases in the immunized population, older children and adults. Sometimes the physician will not be alerted to the presence of whooping cough in the community until the first typical case presents itself in the unvaccinated child. For more information, please call the Bureau of Immunizations, 314/ 751-6133. ■

The State Public Health Laboratory provides a collection kit for *Bordetella pertussis*. The kit contains all the directions and materials needed to collect and submit suitable specimens for DFA and culture. Close attention to the directions for specimen collection and shipping will greatly enhance the chances for appropriate laboratory results. Serologic methods at present are not routinely available nor are interpretations of results reliably established. The SPHL provides DFA and culture services. *Any physician, laboratory or hospital desiring collection kits or assistance should telephone 314/ 751-0633, Reference Bacteriology.*

Ehrlichiosis

F.T. Satalowich, D.V.M., M.S.P.H., Chief, Bureau of Veterinary Public Health

Background

Ehrlichiosis was first recognized in Missouri in 1986, confirmed by CDC as the cause of disease in seven cases in 1988 and 13 cases in 1989. Human Ehrlichiosis is an acute febrile illness that is possibly caused by *E. canis* or another closely related rickettsia. Ehrlichiae are one of several kinds of obligate intracellular bacteria. Taxonomically, they are grouped with rickettsiae, but they can be distinguished by their unique tropism for circulating leukocytes. Epidemiologic, clinical and laboratory aspects of the disease are still being described.

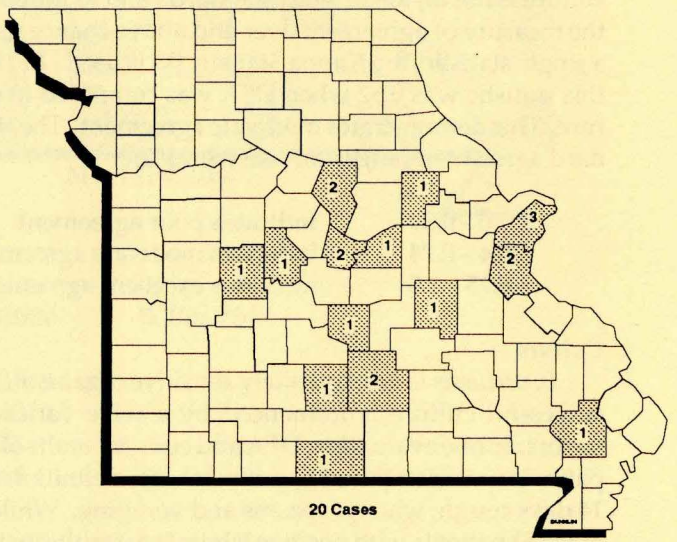
The median age for patients is in the 40's, with most being male. Cases occur primarily during tick season, May thru September. Although a tick vector has not been identified in humans, most patients report a tick bite within the preceding month. From 1986-1989 there have been 125 cases of Human Ehrlichiosis throughout 19 southeastern states.

Most ehrlichiosis patients have a nonspecific febrile illness accompanied by headache, myalgia, anorexia, nausea, vomiting, chills and in some cases, by a rash. Laboratory abnormalities including leukopenia, thrombocytopenia and elevated levels of hepatic aminotransferases are common. Tetracycline appears to be effective in treating ehrlichiosis; the efficacy of other antibiotics has not been evaluated.

Sera from patients suspected to have Ehrlichiosis or Rocky Mountain spotted fever (RMSF) diagnoses who fail to develop specific RMSF antibodies, and from other patients with a documented febrile illness compatible with ehrlichiosis, should be submitted to the Missouri State Public Health Laboratory (314/ 751-3334). The patient's clinical history should accompany the specimens. Paired sera (collected preferably 2-4 weeks apart) will be forwarded to the Centers for Disease Control for testing.

Ehrlichia canis causes a pancytopenia in dogs that becomes chronic if untreated. Certain breeds develop severe infections, characterized by fever, anorexia, dramatic weight loss, marked pancytopenia, anemia, peripheral edema, and hemorrhage. Ehrlichia risticii, a recently discovered species, is the cause of a serious diarrheal disease of horses. Other species of ehrlichiae have been documented as being veterinary pathogens. The University of Missoui-Columbia, College of Veterinary Medicine reports 27 cases of Canine Ehrlichiosis from 1984-1989. For more information, please call your local health department or the Bureau of Veterinary Public Health, 314/ 751-6136. ■

Ehrlichiosis Cases By County
1988 - 1989



Tick Prevention

TICK FACTS

* Ticks are blood-sucking arachnids capable of transmitting serious and sometimes fatal illness.
* Late spring and summer are peak times for exposure to ticks.
* Ninety-four percent of cases of tick-transmitted diseases occur between April 1 and September 30.
* Most tick bites resolve uneventfully.
* Victims are seldom aware of crawling ticks or even the process of attachment.
* Ticks transfer infection only after they have fed for several hours and are engorged.

ENVIRONMENTAL PREVENTION

* Keep weeds and grass cut in yards and recreational areas.
* Clear brush along paths.
* Remove ticks from dogs to minimize the tick population in areas near residences.

PERSONAL PREVENTION

* Avoid known tick-infested areas.
* Apply repellents (read ingredient labels)
* Wear clothing that interferes with tick attachment (boots, full length and one piece outer garments)
* Avoid sitting on grass and logs where exposure to ticks increases.
* Every 4-6 hours, inspect entire body, including hairy parts, to detect and remove attached ticks.

*TICK REMOVAL PROCEDURE - **The mechanical removal technique should be used for all tick removal.***

* It is important to remove a tick from the host as soon as possible after it is discovered.
* Proper tick removal is as important in reducing the chance of infections as timely removal.
* Exercise the same precautions when removing ticks from animals as when removing ticks from humans.

Recent Outbreak of Measles Traced to Medical Settings

Major outbreaks of measles have occurred in in many states including Missouri. One setting ofte implicated in the transmission of measles is physician offices or waiting rooms of large medical centers and clinics. According to the Centers for Disease Control,during 1980-1988, the percent of measles cases reported as transmitted in medical settings increased from 0.5 to 5.8 percent.

In Missouri, one individual recently diagnosed with measles exposed a total of 50 persons on three separate occasions as he sought medical care in his community. Health departments subsequently contacted the exposed individuals by letter, informing them of the risk and instructing them to seek medical attention. Fortunately, no secondary cases have been reported. However, recent outbreaks have occurred in the states of Washington and Oklahoma which can be directly linked to medical centers. One of the outbreaks resulted in the tragic death of an unimmunized clinic clerk who was exposed to a case of measles in the waiting area where she worked.

Nosocomial transmission occurs due to low immunization levels among medical workers and because many providers have not promptly recognized measles cases and isolated those patients from common waiting and examination areas.

Physicians and other health care providers in Missouri are strongly encouraged to:

—be alert to measles cases and outbreaks in their communities,
—promptly report suspect measles cases and
—aggressively triage suspect patients seeking medical care to assure minimal exposure of others in their waiting rooms and offices. ■

A Note from the State Public Health Laboratory

Eric C. Blank,, Dr. P.H., Director

In addition to specimen quality, three conditions need to be satisfied in order for a laboratory to perform a test. First, the specimen must be labeled with the patient's name or other unique identifier which then must match the name or identifier on the request form. Secondly, there must be a clear indication of the test or tests requested. And third, there must be a submitter's name and address on the request form to whom the laboratory is to report the results of the testing.

Failure to meet any of these conditions will result in the specimen not being tested or, if tested, results not being reported. As a reference lab, removed from direct contact with the patients from whom specimens are collected, we cannot assume an unlabeled specimen came from a particular patient and, technically, should not test such a specimen. If we are not told which test or tests to run, we obviously cannot run any test. And, if there is no submitter's name and address to report to, we cannot report results.

The State Public Health Laboratory processes an average of over 2,000 specimens and samples daily. These specimens and samples come from a number of submitters: physicians, hospitals, clinical labs and, local health departments and their associated clinics. To effectively manage this workload, to perform testing within established time limits, and to provide some of the customized testing services required by some of the state programs we support, it is imperative that specimens are properly submitted and that we enforce these submission standards.

Everything else aside, it is the patient for whom all of us are working. Taking the extra time to properly label the specimen and complete the request form ensures that the testing will be completed and reported promptly which, in turn, contributes to the proper and timely care for the patient.

For more information regarding laboratory testing, please call the State Public Health Laboratory at 314/ 751-3334. ■

Newborn Screening -- Hypothyroidism, PKU, Galactosemia and Hemoglobionopathies

James Baumgartner, BS, MBA, Chief, Metabolic Disease Unit

	JAN 90	FEB 90	Total Y1
Specimens: Tested	8326	7392	15718
Initial	82.3%	80.7%	12815
Repeat	17.7%	19.3%	2903
Specimens: Unsatisfactory	173	201	374
HT Borderline	79	54	133
HT Presumptive Positive	3	4	7
PKU Borderline	1	10	11
PKU Presumptive Positive	1		1
GAL Borderline	3		3
GAL Presumptive Positive			0
FAS (Sickle cell trait)	91	83	174
FAC (Hb C trait)	27	13	40
FAX (Hb variant)	9	12	21
FS (Sickle cell disease)	3	2	5
FSC (SC disease)	2	1	3
FC (Hb C disease)			0

Executive Summary of Strategic Plan for the Elimination of Tuberculosis in Missouri

Developed by Missouri Advisory Committee for the Elimination of Tuberculosis

The Strategic Plan for the Elimination of Tuberculosis from Missouri has been developed in order to implement the national plan developed by the Centers for Disease Control Advisory Committee for the Elimination of Tuberculosis (ACET). The national goal of tuberculosis elimination was defined as a case rate of less than one per million population by the year 2010, with an interim target of a case rate of 3.5 per 100,000 population by the year 2000. For Missouri, this means a case rate of less than 0.5 per 100,000 by 2010. The Missouri plan was prepared by a committee of health care professionals in the public, private and voluntary sectors throughout the state. This committee, appointed by the Boards of the American Lung Association constituents in Eastern and Western Missouri, became known as the Missouri Advisory Committee for the Elimination of Tuberculosis (MACET).

A major component of the plan is an inventory of existing tuberculosis resources in Missouri. This inventory was completed through site visits conducted by committee members to each program area and through a survey of program performance, utilizing performance indicators in A***LA's Guide for Tuberculosis Programming in the 1980's***. Strengths and weaknesses of each program were assessed by utilizing a method referred to as "internal analysis". An "external analysis" was conducted which surveyed trends in tuberculosis incidence, as well as the awareness of the tuberculosis problem on the part of the public, health care professionals, community leaders and legislators.

As a result of this inventory and analysis, several overall or general Missouri problem issues and concerns were identified. They were divided into six categories, namely:

1 - Education of the public and healthcare providers.
2 - Education of community leaders and legislators.
3 - Funding.
4 - Staffing.
5 - Tuberculin skin testing programs.
6 - Relationship between tuberculosis and human immunodeficiency virus (HIV) infection.

MACET suggested that general recommendations begin immediately to address these problems.

The national (ACET) plan was developed with a three-step plan of action:

Step 1: more effective use of existing prevention and control methods, especially in high risk populations;

Step 2: the development and evaluation of new technologies for treatment, diagnosis and prevention; and

Step 3: the rapid assessment and transfer of newly developed technologies into clinical and public health practice.

Due to the fact that the Missouri Advisory Committee would have little input at the present time, into the development, evaluation and implementation of new technologies and their rapid transfer into practice, (Steps 2 and 3 of the national ACET plan), members chose to focus on implementation of the four major strategic components of Step 1 of the National ACET plan, namely:

1 - To improve surveillance for tuberculosis;
2 - To improve tuberculosis case prevention;
3 - To improve the containment of tuberculosis disease;
4 - To improve tuberculosis program assessment and evaluation;

Specific objectives were defined in response to problems identified in each strategic component of Step 1. Methods were outlined to achieve each objective by specific target dates.

In order to make the plan relevant to state, and local needs and resources, detailed action steps will be developed by each major political jurisdiction of the state, (at the present time represented by the Missouri Department of Health, Kansas City and St. Louis City Health Departments and St. Louis County Health Department).

Conclusion

For this plan to succeed, a cooperative and collaborative effort of state and local health agencies, voluntary health agencies, professional societies and organizations, political officials and health care professionals in both the public and private sectors will need to dedicate themselves to eliminating this disease which is both preventable and curable. The strategies outlined in this plan represent the efforts of the Missouri Advisory Committee for the Elimination of Tuberculosis to analyze the action needed to reach the goal of elimination of the disease in Missouri by the year 2010.

In the words of the authors of the national strategic plan:

"It is time to commit to a tuberculosis free society! The strategies for achieving elimination are set out in this document. Failure to attempt elimination of tuberculosis would be a tragedy. The task will not be an easy one: it will require considerable commitment at all levels. The challenge to carry out this plan is a test of our willingness and ability as a society to respond to a very serious health problem which disproportionately affects its disenfranchised members. A great Nation such as ours can carry out this plan..."

The members of the Missouri Advisory Committee for the Elimination of Tuberculosis have accepted this challenge and seek to have Missouri lead the way in the attainment of this noble goal.

For more information, please contact your local health department or the Bureau of Tuberculosis Control, 314/ 751-6122. ■

Diagnostic Clues for Important Rash Illnesses

Since December 1988, the Bureau of Immunization has seen an increase in the reporting of rash illnesses. Because of the many similarities in the appearance of rash illnesses, case diagnosis can be difficult. The following chart outlines characteristics of the three most commonly confused rash illnesses:

FIFTH DISEASE

* Presents with mild, systemic symptoms, e.g. malaise, myalgia.
* Fever often times not present (occurs in only 15-30% of cases).
* Rash appears 1-4 days after systemic symptoms.
* Has distinctive rash which usually begins on the face.
* Rash appears intensely red, causing "slapped cheek" appearance.
* One to 4 days following rash onset, the maculo-papular rash spreads to the arms and trunk, buttocks and thighs.
* Rash appears symmetrically bilateral.
* Rash recurs and fluctuates with exposure to temperature and sunlight.

MEASLES

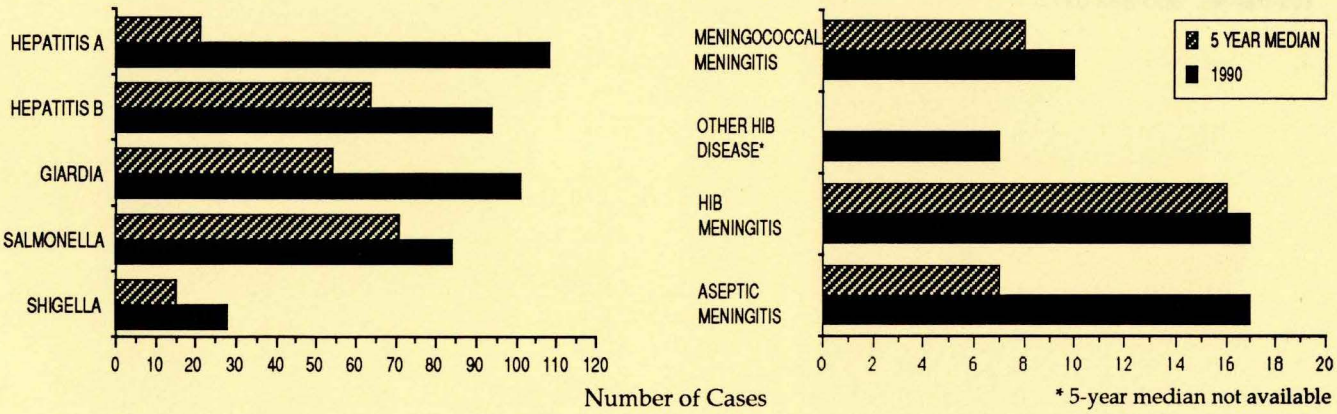
* Usually presents as a severe acute illness.
* Rash in the majority of cases is accompanied by fever of 101 degrees or greater.
* Often accompanied by cough, coryza and conjunctivitis.
* Rash is erythematous and maculopapular which becomes confluent; appears pink at the time of onset and progresses to dusky, reddish brown.
* Rash typically begins around the ears and hair-line and spreads to the arm and trunk after the first day.
* Rash usually lasts about five days.
* Koplik spots, tiny blue-white pinpoint swellings in the mucous membranes of the mouth, are often present.

RUBELLA

* Usually a mild disease, with a low grade (<101 degrees) fever
* Presents as a diffuse pink-red maculopapular rash.
* Rash begins on face, and rapidly involves trunk within 24 hours.
* Rash tends to fade and disappear from points previously involved.
* Postauricular and/or occipital lymphadenopathy is often present.

Editor's Note...please refer to the Bi-monthly Statistical Insert for additional information on these diseases. The next issue will contain the 1989 Annual Disease Reports.

Selected Disease Reports
January-February 1990 vs. 5-year Median



* 5-year median not available

Toll-Free Eosinophilia-Myalgia Syndrome Hotline for Physicians—800-EMS-2829

The Public Health Foundation has established a toll-free information line for eosinophilia-myalgia syndrome (EMS), an illness related to the use of food supplements containing L-tryptophan. The number is 800-EMS-2829. EMS has been called a "major public health problem" by federal health officials. Health and Human Services Secretary Louis W. Sullivan has urged everyone to stop taking L-tryptophan supplements immediately.

Physicians who call the EMS Hotline will receive up-to-date clinical information on EMS. In addition, physicians may request physician-to-physician consultation on EMS. Referrals to treatment centers around the country will also be provided.

In March, the Food and Drug Administration recalled all products containing manufactured L-tryptophan. While L-tryptophan had been sold as a nutritional supplement, many consumers used it to aid insomnia, premenstrual syndrome, weight loss, and depression. As of April 20, there were 1,477 cases of EMS reported, and 21 deaths documented nation-wide. Symptoms of EMS include intense myalgia, weakness, fever, fatigue, arthralgia, rash, dyspnea or cough, and swelling of the extremities.

The EMS Hotline, which also answers questions from the lay public, operates Monday through Friday from 10 a.m. to 6 p.m. Eastern time. The service is free of charge both to physicians and consumers.

The Washington, D.C.-based Public Health Foundation is a nonprofit research and service organization. The EMS Hotline is supported by the Council for Responsible Nutrition and private contributions. Eosinophilia-myalgia syndrome (EMS) is an illness associated with the use of manufactured L-tryptophan, an amino acid used in some nutritional supplements. L-tryptophan has been used to treat insomnia, depression, and premenstrual syndrome, weight loss, and as a nutritional supplement.

EMS is defined by the presence of eosinophilia and generalized muscle pain. EMS was first identified in October of 1989, although many people started developing symptoms in the spring of 1989. Similar cases related to the use of L-tryptophan have been identified as far back as the early 1980's.

Reporting EMS Cases--

All cases of EMS should be reported to the state health department (800/392-0272). ■

Missouri EPIDEMIOLOGIST

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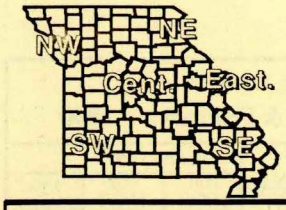


Missouri Department of Health
Disease Prevention - Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period *
November & December , 1989

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	2 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1989	1988	FOR 1989	FOR 1988	5 YR MEDIAN
Vaccine Preventable Dis.																
Chickenpox	230	287	117	266	79	121		0	8	64	0	1172	1932	9086	11350	5093
Diphtheria	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Influenza	1	7	28	0	0	0		3	0	7	1	47	6	293	148	69
Measles	0	32	182	0	0	0		0	1	5	0	220	63	671	65	32
Mumps	0	1	2	2	0	1		14	0	5	0	25	34	87	68	23
Pertussis	4	2	4	6	1	1		0	3	2	0	23	3	141	25	32
Polio	0	0	0	0	0	0		0	0	0	0	0	1	0	1	0
Rubella	0	0	0	0	0	0		0	0	0	0	0	0	4	0	0
Tetanus	0	0	0	1	0	0		0	0	0	0	1	0	4	1	2
Viral Hepatitis																
A	8	0	6	8	6	8		132	13	8	0	189	198	810	897	138
B	6	4	22	13	4	10		34	9	16	6	124	143	704	639	420
Non A - Non B	0	1	1	0	2	0		1	0	4	0	9	6	53	50	42
Unspecified	0	2	0	0	1	0		0	1	0	1	5	5	13	21	21
Meningitis																
Aseptic	1	0	6	1	3	1		16	0	3	3	34	30	223	124	156
H. influenza	3	0	8	3	3	3		3	3	3	2	31	43	106	138	131
Meningococcal	0	0	0	1	0	2		2	0	0	0	5	6	21	33	40
Other	4	0	0	4	3	1		0	0	2	0	14	12	64	64	64
Enteric Infections																
Campylobacter	0	0	5	3	4	6		4	5	6	7	40	71	473	441	281
Salmonella	4	2	14	4	13	11		25	6	8	5	92	143	676	772	690
Shigella	0	1	1	5	0	5		17	12	2	0	43	101	411	607	244
Typhoid Fever	0	0	0	0	0	0		0	0	0	0	0	1	0	3	6
Parasitic Infections																
Amebiasis	0	0	0	0	0	2		1	1	2	0	6	5	19	30	28
Giardiasis	1	8	56	4	5	34		10	3	21	6	148	119	859	654	516
Toxoplasmosis	0	0	0	0	0	0		0	0	0	0	0	0	4	17	20
Sexually Transmitted Dis.																
AIDS	19	1	6	6	9	4	7	44	21	11	9	137	57	481	403	91
Gonorrhea	77	13	79	69	44	39		1217	1533	787	33	3891	3407	21053	17241	19029
Genital Herpes	39	11	41	18	17	28		124	138	53	9	478	424	2283	2250	1340
Nongonoc. urethritis	54	10	32	24	2	13		188	465	225	4	1017	1286	6880	7606	7895
Prim. & Sec. syphilis	0	0	0	3	0	0		24	7	4	1	39	32	162	154	133
Tuberculosis																
Extrapulmonary	0	0	2	2	0	1		1	3	4	0	13	10	51	42	49
Pulmonary	3	0	8	10	5	2	2	11	5	11	1	58	48	227	233	269
Zoonotic																
Animal Bites	129	25	28	72	47	49		0	0	483	0	833	1203	5687	7274	1070
Psittacosis	0	0	0	0	1	1		1	0	0	0	3	2	5	3	1
Rabies (Animal)	0	1	1	2	0	0		0	0	2	0	6	3	62	36	59
Rocky Mtn. Sp. Fever	0	0	1	0	0	0		0	0	0	0	1	5	48	54	25
Tularemia	0	0	2	0	4	0		1	0	0	0	7	5	39	45	40

Low Frequency Diseases

Anthrax
Botulism
Brucellosis - 1
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious) - 2
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 1
Legionellosis - 6
Leptospirosis
Lymphogranuloma Venereum
Malaria - 3
Plague
Rabies (human)
Reye's Syndrome - 1
Toxic Shock Syndrome
Trichinosis - 1

Outbreaks

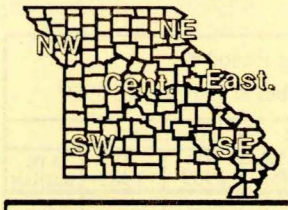
Foodborne/Waterborne - 3
Histoplasmosis
Nosocomial - 7
Pediculosis
Scabies - 4
Other - 1 (E. Coli)
- 1 (Giardia)

*Reporting Period Beginning October 29 , Ending December 30, 1989

**Totals do not include KC, SLC, SLCo, or Springfield

***State and Federal Institutions

Due to data editing, totals may change.



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Disease Prevention - Communicable Disease Control

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Reporting Period *
January & February, 1990

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	2 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1990	1989	FOR 1990	FOR 1989	5 YR MEDIAN
Vaccine Preventable Dis.																
Chickenpox	498	492	144	557	490	145		0	5	238	0	2569	2472	2569	2472	2346
Diphtheria	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Influenza	11	7	15	8	1	21		24	31	47	3	168	129	168	129	40
Measles	11	1	13	0	10	0		0	0	0	0	35	198	35	198	0
Mumps	2	0	2	10	0	1		1	0	0	0	16	28	16	28	5
Pertussis	2	1	0	1	0	0		0	2	2	2	10	1	10	1	2
Polio	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0		0	0	0	0	0	1	0	1	0
Tetanus	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Viral Hepatitis																
A	25	0	5	5	9	3		45	12	4	0	108	55	108	55	21
B	9	4	10	5	2	8		20	17	12	7	94	36	94	36	64
Non A - Non B	0	1	0	3	0	1		0	0	1	0	6	2	6	2	4
Unspecified	0	1	0	1	0	0		0	0	0	0	2	2	2	2	2
Meningitis																
Aseptic	2	0	4	3	1	1		3	0	1	2	17	10	17	10	7
H. influenza	0	1	1	2	4	3		1	1	3	1	17	10	17	10	16
Meningococcal	2	0	0	1	1	1		0	4	1	0	10	1	10	1	8
Other	2	0	0	5	2	2		0	0	6	0	17	6	17	6	10
Enteric Infections																
Campylobacter	5	1	4	5	4	6		5	1	7	4	42	33	42	33	26
Salmonella	7	3	6	5	3	15		11	9	18	7	84	74	84	74	71
Shigella	1	0	2	4	1	5		8	6	1	0	28	58	28	58	15
Typhoid Fever	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Parasitic Infections																
Amebiasis	0	0	0	0	0	1		0	0	1	0	2	2	2	2	2
Giardiasis	18	9	13	1	7	24		6	2	20	1	101	52	101	52	54
Toxoplasmosis	0	0	0	0	0	0		0	0	0	0	0	0	0	0	3
Sexually Transmitted Dis.																
AIDS	5	2	4	0	3	4	5	19	30	8	3	83	59	83	59	30
Gonorrhea	109	11	70	62	26	27		1009	1333	505	26	3178	2814	3178	2814	2786
Genital Herpes	41	9	40	17	17	18		94	113	57	12	418	342	418	342	342
Nongonoc. urethritis	22	6	44	12	0	6		180	507	152	0	929	855	929	855	1156
Prim. & Sec. syphilis	1	0	4	0	0	0		14	5	1	1	26	26	26	26	13
Tuberculosis																
Extrapulmonary	0	0	0	0	1	1	0	0	2	0	0	4	2	4	2	3
Pulmonary	6	0	4	5	4	2	1	0	4	2	1	29	16	29	16	25
Zoonotic																
Animal Bites	130	31	34	77	73	58		0	0	214	0	617	604	617	604	67
Psittacosis	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rabies (Animal)	0	1	0	0	0	0		0	0	0	0	1	3	1	3	4
Rocky Mtn. Sp. Fever	0	0	0	1	0	0		1	0	0	0	2	0	2	0	0
Tularemia	0	0	1	1	1	0		0	0	0	0	3	1	3	1	3

Low Frequency Diseases

Anthrax
Botulism
Brucellosis
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 1
Legionellosis - 9
Leptospirosis
Lymphogranuloma Venereum
Malaria - 1
Plague
Rabies (human)
Reye's Syndrome
Toxic Shock Syndrome - 4
Trichinosis

Outbreaks

Foodborne/Waterborne
Histoplasmosis
Nosocomial
Pediculosis
Scabies
Other

*Reporting Period Beginning January 1, 1990 , Ending March 3, 1990.

**Totals do not include KC, SLC, SLCo, or Springfield

***State and Federal Institutions

Due to data editing, totals may change.

Missouri
EPIDEMIOLOGIST

Volume XII, Number 3 *June 1990*

Human Papilloma Virus Infections (Venereal Warts)

George J. Fuchs, MD, James W. Daly, MD

Introduction

Human papilloma virus (HPV) infections are an enigma to the clinician for diagnosis, treatment and follow up care. Clinical expressions of papilloma virus are so broad that no single diagnostic test or single therapeutic modality will reliably detect and/or treat all stages of HPV expressions. Perhaps in the near future a systemic chemotherapeutic agent and/or a vaccine may be forthcoming. For now, clinicians need some consistent and reliable method to diagnose, treat and follow patients with HPV.

Gynecologists are convinced HPV and specifically HPV types 16 and 18 play a significant role in the development of lower genital tract intraepithelial neoplasia (CIN) as well as carcinoma of the cervix and carcinoma of the vulva. The most common expression of HPV is the genital wart.

More than 60 viral types of HPV have been identified. Approximately 16 viral DNA types are involved in genital condyloma. HPV types 6 and 11 infections are responsible for several clinical expressions: benign exophytic condyloma acuminata of the genital tracts of both males and females, intraepithelial neoplasia of these same areas and papilloma of the upper airway of infants. Pregnant women have a relatively low incidence of genital HPV 6 and 11 infections, which may explain the infrequency of perinatal HPV infections. HPV types 6 and 11 are the most common types of condyloma and are reflected as CIN 1 on Pap smear and histologically.

HPV types 16 and 18 have more serious carcinogenic potential. These types are associated with high grade intraepithelial neoplasia, moderate to severe dysplasia as well as carcinoma in situ and invasive cancers of the cervix and vulva. Other viral DNA types — 31, 33 and 35 — have a more intermediate oncogenic potential. Recently, types 42, 43 and 44 have been identified and apparently have even lower malignancy potential.

Epidemiology

Unlike studies of other sexually transmitted diseases (STDs) epidemiologic studies of HPV are hampered by the inability to culture the virus and the current lack of serologic tests. HPVs are not reportable to health officials in the United States, therefore, precise incidence data is not available. However, according to a survey of private office-based physicians in the United States, a 459 percent increase of office consultations for genital warts occurred between 1966 and 1988. There are an estimated one million cases (or more) annually in the United States.

Risk Factors

Multiple or casual sexual partners are frequently associated with HPV infection. Other sexually transmitted diseases, such as chlamydia trachomatis, trichomonas vaginalis and neisseria gonorrhea, monilia and gardnerella infections, may be co-existent. Pregnancy, oral contraception, and steroid use seem to alter the host immune systems and encourage the rapid growth of HPV. Chronic disease, such as Hodgkins disease where immunosuppression is evident, also seem to encourage HPV growth. Cigarette smoking is an important risk factor in the development of vulvar and cervical carcinoma. Apparently, this also holds true for HPV, perhaps by reducing local cervical tissue immunity.

Transmission

Sexual contact of the genitals readily transmits the HPV. The incubation period from DNA inoculation to clinical expression is about three to six months. The incubation period may vary anywhere from three weeks to eight months, seemingly dependent on the virulence of the virus and/or the strength of the host immune system. Ninety percent of women with condyloma have associated subclinical HPV infection in one or more genital tract sites. The most common site is around the hymenal and urethral ring

(Continued)

Dr. Fuchs is Clinical Associate Professor and Dr. Daly is Professor and Chairman of the Department of Ob-Gyn, University of Missouri- Columbia, Missouri

Inside this issue...

area followed by the cervix, vulva and the anus. From 65 percent to 70 percent of male consorts of women with HPV-associated cervical disease will, histologically, have lesions. HPV in children has possibly been associated with sexual molestation. Apparently however, some virginal girls have genital and perianal condyloma. These children deny sexual contact of any type. Homosexuals commonly have perianal and anal canal condyloma acuminata. Other methods of transmission are through inanimate objects including clothing.

Natural History of HPV

There are four phases of the natural development of the HPV lesions: 1) *Incubation, 2) Active Expression, 3) Host Containment, and 4) the Late phase.* During *incubation*, usuallysix to eight weeks are required for the transfer of the HPV DNA by transmitting its virus to specific proteins. The *Active expression phase* is characterized by rapid epithelial and capillary proliferation lasting for three to six months. The epithelial proliferation results in histological acanthosis, hyperchromasia and increased mitotic activity. Early capillary growth is usually insufficient to cause a wart, but HPV can be identified by applying 5 percent acetic acid (white vinegar) to the area. It can be recognized as a flat condyloma. Later in this phase, typical vegetative lesions occur which are highly contagious. The *host containment phase* occurs about three months after the clinical or subclinical appearance of a lesion. At this time, the host immune system usually intervenes. During this phase, 20 percent of the lesions will regress spontaneously. Another 60 percent of the HPV lesions regress, following local chemical destructions. Approximately 20 percent of the HPV lesions will linger and persist. These latter HPV expressions are resistant to the standard office therapy, such as use of thichloroacetic acid, etc. Persistent HPV lesions usually require excisional or laser therapy. The *late phase* occurs about 9 months after inoculation. Late Phase patients can be divided into patients who remain in total remission and those who relapse into continued active disease expression (part of the 20 percent non-responsive lesions).

Diagnosis

Diagnosis is made primarily by the gross clinical appearance, cytology and tissue biopsy. The location of HPV usually occurs around the hymenal ring area but can also involve the cervix, the vagina, the vulva, urethra, perineum, as well as the anus. It is quite common for the lesions to be located in more than one area. The gross appearance can vary from a flat, white epithelial lesion to a large, vegetative, warty lesion. The large single HPV lesion (3 - 4 centimeters in diameter) is often a precursor to the verrucous carcinoma of the vulva.

Cytology frequently reflects the HPV as Koilocytosis. Eighty percent of the HPV cervical infections are reported in association with CIN positive biopsies. The HPV is also detected in adjacent squamous epithelium in over 90 percent of squamous cell cervical cancers. Some investigators feel that they can distinguish the character of HPV histologically-- variation of types 6, 11 and also higher 16 and 18. But most pathologists cannot accomplish this with consistent accuracy.

Viral typing of HPV lesions can now be determined by biomolecular techniques by retrieving the virus DNA information from the Pap smear and/or biopsy specimens. However, cost and laboratory accessibility seriously limit clinical screening. Viral testing will become practical when the clinical significance of the various HPV subtypes is known.

HPV Patient Profile

The patient profile is a system for communication between clinicians and chart documentation. A profile of six determinations is established for each patient: *1) age, 2) symptoms, 3) grade, 4) stage, 5) Pap smear, and 6) biopsy.* Perhaps, in the future, viral typing will be included.

The grade and stage of HPV, along with the Pap smear and biopsy, are the substance of the patient profile. The *grade* is determined by the clinical examination and by the use of the colposcope. The gross clinical lesion is designated macrocondyloma and can be visualized or palpated. Microcondyloma is identified only by the colposcope. The grade is expressed by numerals 1-4. (fig. 1).

The *Stage* reflects the number of areas involved in the entire genital tract. It is also expressed by numerals Stage I thru IV (fig 1). The value of the *Pap smear* and *biopsy* are obvious. The patient profile is recorded in figure 1.

Therapy

Because of the varied clinical expressions of HPV, therapy is varied. Five treatment regimens are suggested: 1) *Observation and office examinations,* includes a pelvic examination, Pap smear biopsy and colposcopy at regular intervals. It can be the primary treatment of after definitive therapy has been administered, 2) *Chemical destruction,* the use of topical trichloroacetic acid (TCAA) is used commonly and safely. It is used independently or in conjunction with cryotherapy or laser. Usually 50 percent to 70 percent solution is sparingly and carefully applied to the cervix or other focal lesions. Topical chemicals require a careful focal application so normal tissue injury is minimal. A stronger concentration (70 percent to 100 percent) may be needed on skin of the perineum or vulva. TCAA is applied topically until the lesion takes on a total white crusty appearance. Occasionally, a repeat application is necessary in two or three weeks. A burning sensation may be experienced by the patient with external use. This rapidly dissipates within two or three minutes.

Efudex 2.5 percent to 5 percent is another chemical option for treating dissemenated or focal vaginal lesions. One full applicator of Efudex is placed high in the

Figure 1

	AGE	SYMPTOMS	GRADE	STAGE	PAP SMEAR	BIOPSY
Patient Profile =		(+) (-)	1-4	1-4	(+) (-)	(+) (-)

Using the six aforementioned determinations, the following are examples of the Patient Profile.

	AGE	SYMPTOMS	GRADE	STAGE	PAP SMEAR	BIOPSY
Patient A	19	Sym	4	3	+	+
Patient B	49	Asy	2	2	+	+

The patient profile enables the physician to discuss a specific patient and allows better documentation for therapy protocols as well as accurate follow-up.

vaginal vault. There are two schedule options: 1) Every other h.s. x 5 days x 2 weeks for a total of 10 applications, or 2) Every other h.s. x 14 days for a total of seven applications. Efudex is additionally applied sparingly to the vaginal opening. A tampon may be optionally inserted into the vagina to assist retention of medication. Occasionally, patients are hypersensitive to Efudex which demands immediate discontinued use. All precautions for Efudex should be observed. Efudex can be used either as a primary therapy or as an adjunct to laser evaporation, 3) *Thermal destruction*, includes focal and total genital and total genital laser evaporation or laser conization. Laser may be used with or without chemical destruction, 4) *Surgical excision*, which is utilized if tissue is needed for study or if the lesion dictates the need for excision and, 5) *Chemotherapy* with intralesional injection of Interferon Alpha.

The substance "Interferon" was first described by Isaccs and Lindemann in 1957, as endogenously produced cytokines that protect cells against viral infection. Subsequent work has shown that there are three major types of Interferon; Alpha, Beta and Gamma. The Interferon Alpha is the agent currently used in the treatment of condyloma acuminata.

At present, Interferon is utilized by repeated intralesional injections and is suggested for persistent, focal, symptomatic lesions with previous treatment failure. Expense and time required for treatment is a limiting factor.

All five treatment regimens require both patient and physician acceptance and compliance. Therefore, alternative treatment regimens must be offered.

Conclusion

Because of the viral etiology of HPV, cure is not always possible with present treatment regimens. Therefore, the clinician must be content with control of the disease rather than cure in some patients.

As Friedrich writes, "To help the patient cope with the frustrating phenomenon of recurrence "The Dandelion Analogy" can be provided. Everyone is familiar with the little yellow flower that can spring up in even the closely tended lawns. Once recognized, they are altered with chemical poison, root cutters, and flame throwers. Yet no one is surprised to find that new weeds spring up within a few weeks of such treatment. The seeds are presumed to be underground and cannot be recognized until they sprout. Only then does direct treatment become possible, and it is very much the same with condyloma acuminata."

Finally, HPV, specifically DNA Types 16 and 18, are strong oncogenic cofactors for carcinoma of the cervix and vulva. These patients, therefore, must be monitored for life with regular examinations, Pap smears, colposcopy and indicated biopsies. The Patient Profile allows a method of communication for clinical HPV. (See Patient Profile on Page 4.)

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NOTE: A sample Patient Profile Work Sheet for Condyloma acuminata is included on page 4.

If you have questions regarding HPV, please contact the Bureau of Sexually Transmitted Diseases, 314/ 751-6141. ■

Condyloma Treatment Regimens

I. Observation and Office Examinations
   - A. Pelvic exam
     Pap smear
     Colposcopy/biopsy
   - B. First year - every 4 months
     Second year - every 6 months
     Annual examinations thereafter

II. Chemical Destruction
   - A. Chemical destruction (per choice) - topical
     1. Trichloroacetic acid - 50%, 70%, 100% - focal use
     2. Bichloroacetic acid - focal use
     3. Podophyllin 25% - external use only
     4. Liquid nitrogen - focal use
     5. Efudex 2.5% - 5% - intravaginal/focal use
   - B. Chemical applications plus cryosurgery to cervix
     (Freeze 3 minutes - thaw - freeze 3 minutes)

III. Thermal Destruction
   - A. Laser evaporation of appropriate genital areas colposcopically identified
   - B. Add chemical supplement treatment 6 weeks post laser
   - C. Debulk lesion with bovie - laser evaporation base

IV. Surgical Excision
   - A. Conization of the cervix
     1. Traditional cone
     2. Laser cone
   - B. Partial superficial selective vulvectomy
   - C. Large bulk lesions
     1. Bebulk with bovie
     2. Follow with laser to base

V. Chemotherapy (interferon - alpha)
   - A. Intralesional injection
     1. Intron-A - 1,000,000 I.U.
     2. Alferon-N - 250,000 I.U. b.i.w. x 3 weeks
   - B. Intralesional injection plus chemical applications

Sample Patient Profile Work Sheet

PATIENT'S NAME _____ REFERRED BY _____

DATE _____

PATIENT PROFILE WORK SHEET
CONDYLOMA ACUMINATA

PATIENT PROFILE =	I	II	III	IV	V	VI
	AGE	SYMPTOMS (+) (-)	GRADE 1-4	STAGE 1-4	PAP SMEAR (+) (-)	BIOPSY (+) (-)

I. AGE

II. SYMPTOMS ( ) NONE ( ) AWARENESS ( ) BURNING ( ) ITCHING

III. GRADE (All grades determined by gross appearance and colposcopy.)

1. ( ) Macrocondyloma - mature - stable
2. ( ) Microcondyloma
3. ( ) Microcondyloma/macrocondyloma - various stages
4. ( ) A. Florid and extensive - rapidly spreading
   ( ) B. Persistent or new condyloma - post therapy

IV. STAGE (AREAS): All stages determined by gross appearance and colposcopy.
NOTE: Add areas = true stage

1. ( ) A. Cervix - transformation zone
   ( ) B. Vagina - Upper 1/2
1. ( ) A. Vagina - Lower 1/2 — Ant: R sulcus, L sulcus; Post: R sulcus, L sulcus
   ( ) B. Hymenal Ring
1. ( ) A. Urethra
   ( ) B. Vulva - A. Labia minora B. Labia majora C. Fourchette D. Clitoris E. Perineum
1. ( ) Anus (up to pectineal line)

V. PAP SMEAR – Negative (–) Positive (+)

VI. BIOPSY – Negative (–) Positive (+)

	AGE	SYMPTOMS	GRADE	STAGE	PAP SMEAR	BIOPSY
PATIENT PROFILE =						

SIGN _____

Have you moved recently? Please send your address corrections....

The *Missouri Epidemiologist* is a bi-monthly newsletter sent free of charge. Comments should be sent to:

Division of Environmental
Health and Epidemiology
1730 East Elm, P.O. Box 570
Jefferson City, MO 65102

William R. Schmidt, M.P.H., Director
Sue Heisler, Managing Editor

Pamphlet Available "About Venereal Warts"

The Bureau of Sexually Transmitted Diseases has produced a pamphlet which answers some of the commonly asked questions about venereal warts. Copies of the pamphlet can be obtained through your local health department or by contacting the Bureau at 314/ 751-6141.

Physicians Asked to Assist in Diagnosing Human Ehrlichiosis

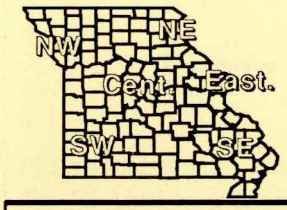
Human ehrlichiosis is a newly recognized tick-borne disease, related to Rocky Mountain Spotted Fever, that has been reported in 18 states. In 1989, 33.3 percent of the ehrlichiosis cases reported to the Centers for Disease Control (CDC) occurred in the state of Missouri.

Patients with ehrlichiosis usually have a fever and many patients reported headache, chills, rigors, malaise, nausea, myalgia and anorexia, during their illness. Few ehrlichiosis patients have a rash, When present, however, it is characterized as maculopapular or petechial and usually appears during the second week of illness. The most common hematological abnormalities are leukopenia and thrombocytopenia. In addition, most patients have elevated levels of alanine or aspartate aminotransferase (SGOT or SGPT).

The etiologic agent has not been isolated from a human, but is serologically related to *Ehrlichio canis*, a white blood cell associated rickettsia of dogs. The Missouri Department of Health (DOH) in conjunction with CDCasks for cooperationfrom practitioners, laboratories, etc., in isolating the causative agent.

If you see a patient with the above clinical signs and hematologic abnormalities, please consider obtaining a blood sample before initiating antibiotic therapy. CDC/DOH requests 60 ml of heparinized whole blood, in a green top tube, sent by overnight courier to State Public Health Laboratory, 307 W. McCarty, Jefferson City, MO 65102 (314/ 751-3334).

DOH and CDC would greatly appreciate your assistance in isolating the causative agent of human ehrlichiosis. If you have further questions, contact Patrick E. Phillips, D.V.M., M.S.P.H., Consultant Epidemiologist, 314/ 751-6477. ■



Missouri Department of Health
Disease Prevention - Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period *
March and April, 1990

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	2 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1990	1989	FOR 1990	FOR 1989	5 YR MEDIAN
Vaccine Preventable Dis.																
Chickenpox	824	355	181	756	539	233	0	0	55	265	5	3213	2747	5961	5219	5219
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Influenza	6	0	2	1	0	0	0	1	0	1	0	11	75	178	243	69
Measles	0	0	0	0	0	5	0	0	0	0	5	10	67	49	266	5
Mumps	3	0	3	7	2	2	0	0	1	2	0	20	8	37	38	13
Pertussis	1	0	3	1	1	1	0	1	0	1	0	9	9	19	10	9
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Viral Hepatitis																
A	33	2	1	7	2	1	0	34	5	8	3	96	132	203	198	49
B	15	5	7	5	5	10	0	16	16	17	3	99	142	192	209	157
Non A - Non B	2	1	0	0	0	0	0	0	0	0	1	4	8	10	14	13
Unspecified	0	0	0	0	0	0	0	1	0	3	1	5	1	7	2	6
Meningitis																
Aseptic	1	1	1	0	1	2	0	2	0	1	2	11	9	28	20	15
H. influenza	3	2	3	0	2	2	0	3	0	2	1	18	17	36	31	39
Meningococcal	0	0	0	1	0	0	0	1	0	0	0	2	6	12	7	17
Other	1	0	0	1	2	11	0	1	0	1	0	17	0	23	0	24
Enteric Infections																
Campylobacter	5	0	10	9	6	7	0	4	3	3	13	60	53	103	98	57
Salmonella	6	1	9	1	4	9	0	4	2	7	4	47	79	132	168	163
Shigella	3	0	6	1	1	1	0	4	3	3	0	22	67	50	133	32
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Yersinia	0	0	0	0	1	0	0	1	0	2	0	4	3	11	15	-
Parasitic Infections																
Amebiasis	0	0	1	0	0	0	0	0	0	0	0	1	2	3	7	7
Giardiasis	9	8	21	4	5	15	0	8	5	6	11	92	77	193	158	113
Sexually Transmitted Dis.																
AIDS	15	2	5	2	2	3	3	40	10	7	1	90	59	173	118	49
Gonorrhea	97	14	82	78	37	23	0	1104	1515	667	33	3650	2690	6828	5504	5504
Genital Herpes	38	10	47	21	24	23	0	121	257	94	34	669	415	1087	757	595
Nongonoc. urethritis	54	12	37	6	3	2	0	194	701	167	1	1177	1284	2106	2139	2516
Prim. & Sec. syphilis	0	0	2	2	1	1	0	10	13	6	0	35	21	61	47	38
Tuberculosis																
Extrapulmonary	0	0	0	1	0	0	0	2	4	1	0	8	6	12	8	12
Pulmonary	3	0	3	7	4	1	1	8	8	1	1	37	38	66	54	71
Zoonotic																
Animal Bites	149	32	67	110	74	110	0	0	2	271	18	833	750	1512	1354	799
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies (Animal)	0	3	2	2	1	0	0	0	0	0	0	8	16	10	20	17
Rocky Mtn. Sp. Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Tularemia	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	5

Low Frequency Diseases

Anthrax
Botulism
Brucellosis
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious)
Encephalitis (viral/arbo-viral) - 1
Granuloma Inguinale
Kawasaki Disease - 2
Legionellosis - 6
Leptospirosis
Lymphogranuloma Venereum
Malaria - 2
Plague
Rabies (human)
Reye's Syndrome
Rheumatic fever, acute - 2
Toxic Shock Syndrome - 7
Toxoplasmosis - 1
Trichinosis

Outbreaks

Foodborne/Waterborne – 5
Histoplasmosis
Nosocomial
Pediculosis
Scabies
Other – 4

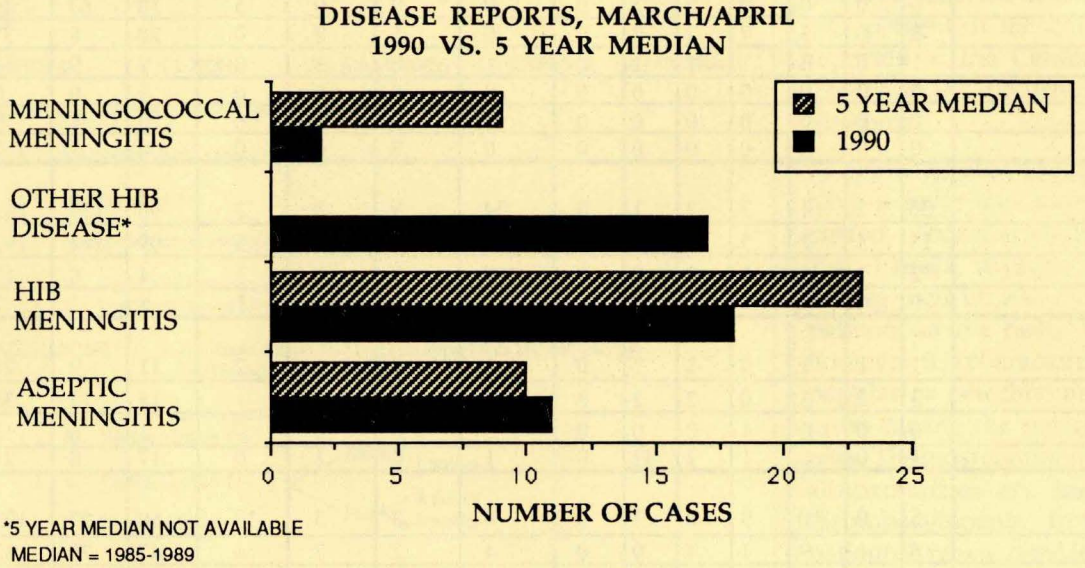
*Reporting Period Beginning March 4, Ending April 28.

**Totals do not include KC, SLC, SLCo, or Springfield

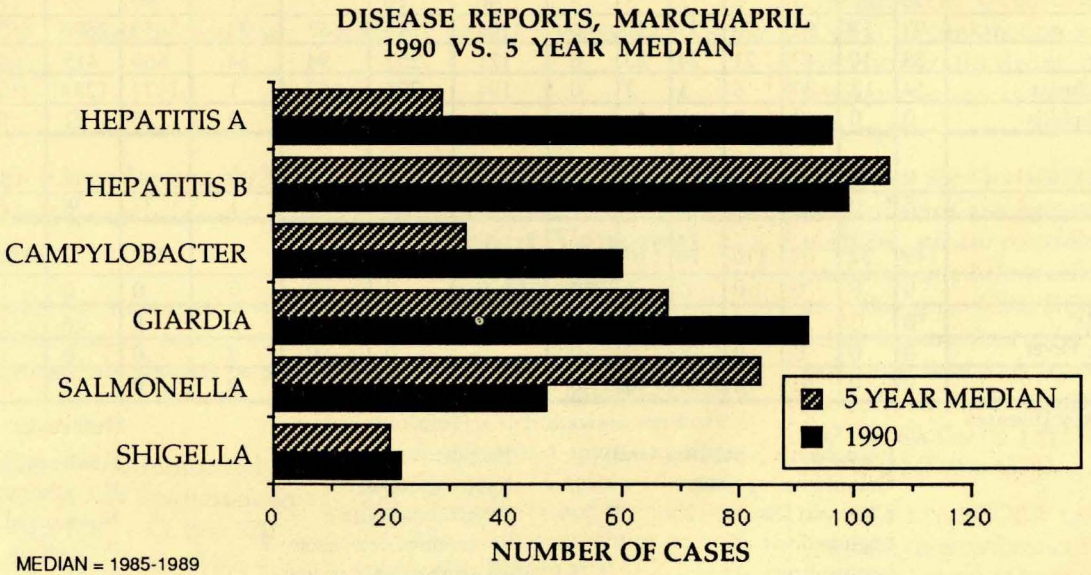
***State and Federal Institutions

Due to data editing, totals may change.

See Reverse Side for Reported Cases by Disease and Area of the State



*5 YEAR MEDIAN NOT AVAILABLE
MEDIAN = 1985-1989



MEDIAN = 1985-1989

Tear off for future reference.

Lyme Disease - A Private Physician's Perspective

(The following article was submitted by Dr. Ed Masters, a family practitioner with Family Physicians Group, Inc., in Cape Girardeau, Missouri.)

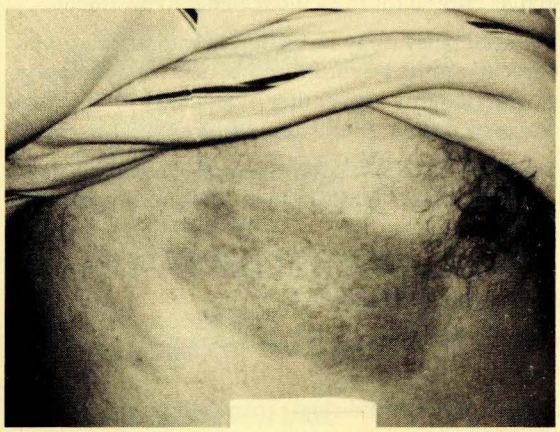
Lyme disease *is* in Missouri. The risk is low but it is not zero. Doctors at Family Physicians Group in Cape Girardeau, Missouri, have seen well over 100 cases of Lyme disease in the past three years. These patients are mainly from Missouri but also come from Southern Illinois, Arkansas, Kentucky and Tennessee. Histories of tick bites followed by classical erythema migrans are common and other clinical evidence of Lyme disease is convincing. Supportive evidence includes positive skin biopsies from erythema migrans, positive ELISAs, positive Western blots, positive experimental Lyme urine antigens, and even positive Polymerase Chain Reaction (PCR) DNA probes. Attempts at culturing *Borrelia burgdorferi* from this area appear to be successful. Characterization is planned but has not been completed.

NOTE: Pictures used with permission from Dr. Ed Masters. Both cases were biopsy-proven.

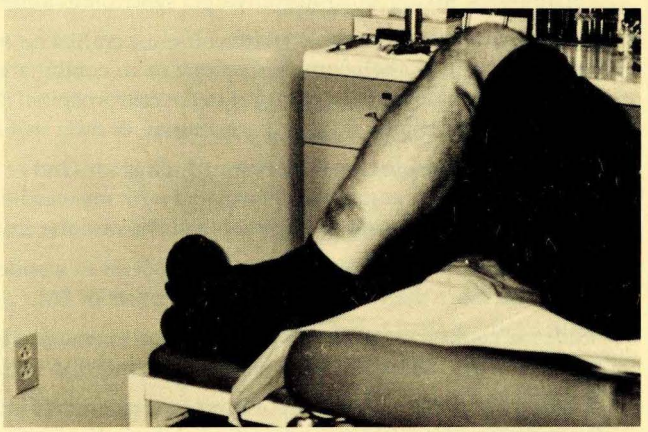
The *Ixodes dammini* tick has not been found in Missouri. Large scale tick studies in Missouri have revealed *Ixodes scapularis* ticks, but none have ever been found to be infected with *Borrelia burgdorferi.* Studies by Drs. Dorothy Feir and Catherine Reppell at Saint Louis University of over 3000 Missouri ticks have been significant in that they have found infected American dog ticks *(Dermacentor variabilis)* and Lone Star ticks *(Amblyomma americanum)* when tested by staining the midgut with the H5332 *Borrelia burgdorferi* specific monoclonal antibody stain. Generally 1-2% infectivity rate was found in Southeast Missouri and St. Louis County. Numerous specific cases implicating *non-Ixodes* ticks as Lyme vectors were reported.

Lyme testing is imperfect. Additional testing problems might possibly be due to outer surface protein differences or strain variations represented here in the Midwest. Research is underway to clarify this. Lyme testing *is* improving, but Lyme is still a clinical diagnosis. It is well documented that a negative Lyme test does not rule out Lyme disease. Sero-negative Lyme disease is a well recognized and proven entity. Cross-reactivity with other spirochetes can create false positive tests. On all of our Lyme patients, we obtain a syphilis serology. We are fortunate in that in the history of Missouri there has never been a case of relapsing fever and leptospirosis is rare. Cross-reactivity with other spirochetes such as oral treponemes is much discussed, but many researchers do not believe this to be a major problem. This group practice has had more problems with the sensitivity of the tests, rather than the specificity.

We encourage physicians to become familiar with this disease. Although uncommon, it is definitely present in Missouri. Public awareness is critical. Of the last ten classic erythema migrans rashes that presented to our clinic, nine of the ten patients indicated that two years ago they would not have gone to the doctor with their EM rash. Without an informed public and medical community, early diagnosis and treatment are virtually impossible. ■



This 47-year-old white male received tick bite on right anterior thorax. The small area of redness rapidly expanded to 10x15 cms, and developed central clearing. ELISA was negative; Western Blot showed 31, 41 and 66 IgG proteins and 60 and 66 IgM proteins. Tick bite occurred in Bollinger County.



A "spider bite" three weeks prior to this rash occurred to this 70-year-old white, male from Perryville. After treatment, a Western Blot was drawn which showed an IgG of 41, 60, and 66 and no IgM bands. The patient responded to doxycycline treatment.

Lyme Borreliosis in Missouri

Lyme Disease Statistics - 1989

In 1989, there were 105 cases of Lyme disease reported to the Missouri Department of Health as opposed to four cases in 1988. Lyme disease was made reportable by law in Missouri on June 26, 1989. The majority of Lyme cases are occurring in the southeastern part of the state with few cases in the northern part of the state.

Symptoms of Lyme disease include muscle and joint pain, fever, headache and a red skin rash. Left untreated, it can lead to a form of chronic arthritis as well as neurologic and cardiac complications such as depression, dementia and heart rhythm disturbances.

The organism responsible for Lyme disease has been identified in two species of Missouri ticks not previously thought to carry the disease. Drs. Dorothy Feir and Catherine Reppell, St. Louis University, have identified the spirochete in the Lone Star tick, *Amblyomma americanum*, and the dog tick, *Dermacentor variabilis*.

Measures should be taken to reduce exposure to ticks. Studies suggest that prompt removal of ticks may limit transmission.

Lyme disease is a systemic tick-borne disease with protean manifestations, including dermatologic, rheumatologic, neurologic and cardiac abnormalities. The best clinical marker for the disease is the initial skin lesion, erythema migrans (EM), that occurs in 60 percent to 80 percent of patients.

Case Definition for National Surveillance of Lyme Disease

Developed by the Council of State and Territorial Epidemiologists (CSTE)
April 1990 and will be used for 1990 case review.

Lyme disease is defined as follows:

1. A person with erythema migrans; or
2. A person with at least one late manifestation and laboratory confirmation of infection.

General definitions:

1. ***Erythema migrans (EM)***: For purposes of surveillance, EM is a skin lesion that typically begins as a red macule or papule and expands over a period of days or weeks to form a large round lesion, often with a partial central clearing. A solitary lesion must reach at least 5 cm in size. Secondary lesions may also occur. Annular erythematous lesions occurring within several hours of a tick bite represent hypersensitivity reactions and do not qualify as EM. In most patients, the expanding EM lesion is accompanied by other acute symptoms, particularly fatigue, fever, headache, mild stiff neck, arthralgias, or myalgias. These symptoms are typically intermittent. The diagnosis of EM must be made by a physician. Laboratory confirmation is recommended for persons with no known exposure.
2. ***Late manifestations:*** These include any of the following ***when an alternative explanation is not found.***
   a. ***Musculoskeletal system:*** Recurrent, brief attacks (weeks or months) of objective joint swelling in one or a few joints ***sometimes*** followed by chronic arthritis in one or a few joints. Manifestations not considered as criteria for diagnosis include chronic progressive arthritis not preceded by brief attacks and chronic symmetrical polyarthritis. Additionally, arthralgias, myalgias, or fibromyalgia syndromes alone are not accepted as criteria for musculoskeletal involvement.
   b. ***Nervous system:*** Lymphocytic meningitis, cranial neuritis, particularly facial palsy (may be bilateral), radiculoneuropathy or rarely, encephalomyelitis alone or in combination. Encephalomyelitis must be confirmed by showing antibody production against ***B. burgdorferi*** in the cerebrospinal fluid (CSF), demonstrated by a higher titer of antibody in CSF than in serum. Headache, fatigue, paresthesias, or mild stiff neck alone are not accepted as criteria for neurologic involvement.
   c. ***Cardiovascular system***: Acute onset, high grade (2nd or 3rd degree) atrioventricular conduction defects that resolve in days to weeks and are sometimes associated with myocarditis. Palpitations, bradycardia, bundle branch block, or myocarditis alone are not accepted as criteria for cardiovascular involvement.
3. ***Exposure:*** Exposure is defined as having been in wooded, brushy, or grassy areas (potential tick habitats) in an endemic county no more than 30 days prior to the onset of EM. A history of tick bite is not required.
4. ***Endemic county***: An endemic county is one in which at least two definite cases have been previously acquired or a county in which a tick vector has been shown to be infected with ***B. burgdorferi***.
5. ***Laboratory confirmation:*** Laboratory confirmation of infection with ***B. burgdorferi*** is established when a laboratory isolates the spirochete from tissue or body fluid, detects diagnostic levels in paired acute and convalescent serum samples. States may determine the criteria for laboratory confirmation and diagnostic levels of antibody. Syphilis and other known causes of biologic false positive serologic test results, should be excluded as appropriate, when laboratory confirmation has been based on serologic testing alone.

Note: It should be emphasized that this is an epidemiologic case definition intended for surveillance purposes. If you have questions, please contact the Section of Disease Prevention at 800/392-0272. ■

Pros and Cons of Disposable Packaging

David Stull, R.S., Bureau of Community Sanitation

With the nation's landfills becoming full, there are many questions about the necessity or convenience of disposable packaging used in many consumer food items. In some instances, such questions have led to outright bans of polystyrene packaging.

Bans against the use of such packaging has been enacted in such cities as Portland, Oregon and in Berkeley and Carmel, California. Laws have been passed though not yet enacted in Minneapolis and St. Paul virtually banning all plastic food containers. The legal battles continue across the country with the food service and plastic industry on one side and environmentalists on the other.

The food industry has been able to provide better food protection, expand into areas where natural resources are not available for utensil washing and liquid waste disposal, operate in emergenciess and disasters, and provide more economical food service because of polystyrene and single-service containers. The International Association of Milk, Food and Environmental Sanitarians, the National Environmental Health Association and the American Public Health Association have affirmed that banning the use of single-service articles would be "...a regressive step opposed to sound and proven public health practice in food-service sanitation."

According to William L. Rathje, Professor of Anthropology, University of Arizona, the perceived idea that fast-food packaging makes up 20.0-30.0 percent of landfill waste is false. Professor Rathje has been studying garbage for 15 years and has led excavations of landfills in Tuscon, Chicago, and the San Francisco Bay area to determine what people threw away between 1977 and 1985.

Professor Rathje found that fast-food packaging comprised only 0.26 percent by weight and 0.24 percent by volume of the landfills. He also discovered that what was thought to be biodegradable is not breaking down. For instance, the contents of the surveyed landfills included newspapers 11.4 percent by weight and 14.11 percent by volume, disposable diapers, 0.86 percent by weight and 1.01 percent by volume, and plastic was in the lead with 16.28 percent by volume. Sunlight and air, essential for the degrading process to occur at any desirable rate, are absent in landfills; therefore, many of the normally, biodegradable products remain intact.

Removing disposables or only plastic disposables from fast-food systems will increase food cost and could result in some loss of food protection while still not significantly reducing the amount of solid waste in our landfills.

Decisions to eliminate disposable packaging from food service must be made in light of the fact that everything in our landfills, from melon rinds to sandwich cartons, is part of our problem. Also, recycling polystyrene containers, as Mc Donald's is attempting on a limited basis, must be considered.

While this article offers no solution to the problem of disposalable packaging in food service, we hope it will point out that there are two sides to this issue and food packaging is only part of the much larger problem of limited landfill space. ■

Newborn Screening -- Hypothyroidism, PKU, Galactosemia and Hemoglobionopathies

James Baumgartner, BS, MBA, Chief, Metabolic Disease Unit

	Mar 90	Apr 90	Total YTD
Specimens: Tested	8438	8331	32487
Initial (percent)	78.4	77.0	25860
Repeat (percent)	21.6	23.0	6627
Specimens: Unsatisfactory	236	207	817
HT Borderline	58	27	218
HT Presumptive Positive	4	9	20
PKU Borderline	25	15	51
PKU Presumptive Positive	2		3
GAL Borderline	5	3	11
GAL Presumptive Positive			0
FAS (Sickle cell trait)	99	104	377
FAC (Hb C trait)	32	21	93
FAX (Hb variant)	6	6	33
FS (Sickle cell disease)	3	5	13
FSC (SC disease)	1		4
FC (Hb C disease)			0

Nitrates in Drinking Water

Randall Maley, Bureau of Environmental Epidemiology

The connection between nitrate-contaminated water and methemoglobinemia, or blue-baby disease, has been known since 1945. At that time, two physicians in Iowa documented that well water containing high levels of nitrate could cause cyanosis in infants fed formula mixed with the water. The Environmental Protection Agency has set the public drinking water standard at 10 parts per million (ppm) nitrate, as nitrogen. Levels as low as 50 ppm have caused cyanosis in infants severe enough to require hospitalization. Fatalities are usually associated with nitrate concentrations above 100 ppm, but have occurred at lower concentrations. In the last four years, there have been several cases of methemoglobinemia from nitrate-contaminated well water reported in the Midwest, with a fatality occurring in South Dakota.

Methemoglobinemia, however, is much less common today than in years past. For example, a 1950 report listed 144 cases of infant methemoglobinemia with 14 deaths in Minnesota in only a 30 month period. The decrease can be attributed to rural public water districts, the popularity of ready-to-feed infant formulas, and public health nursing. Innorthwest Missouri, for example, it is standard procedure for nurses in the Women, Infant and Children Supplemental Feeding Program to request a water sample from all clients who are on well water. Mothers are supplied with ready-to-feed formula until the quality of the well water has been determined.

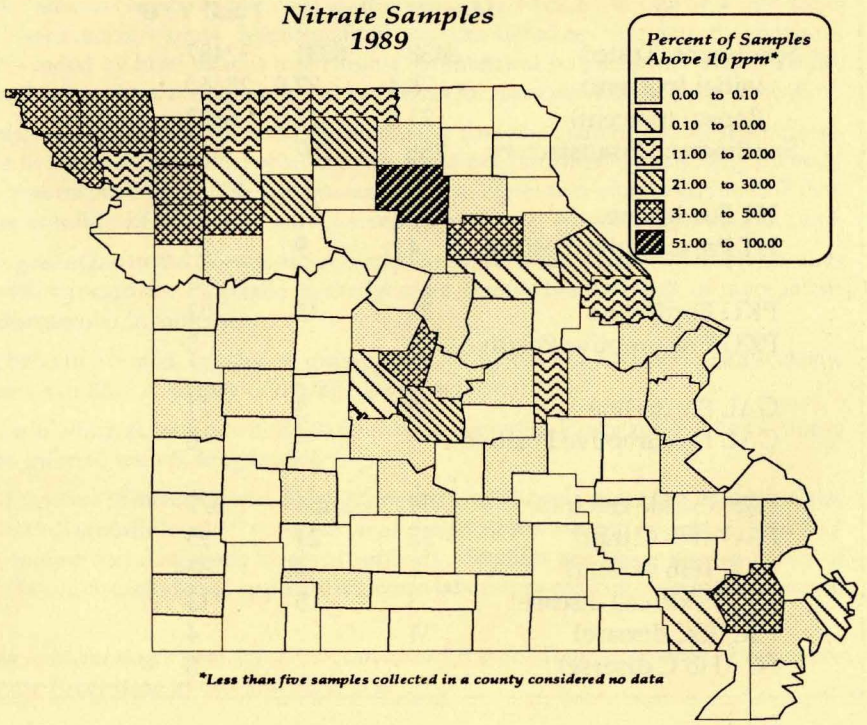
Excluding special studies, the Department of Health's laboratory analyzed 878 well water samples for nitrates during 1989. Of these samples, 138 exceeded the public drinking water standard. Twelve of these samples exceeded 50 ppm and two exceeded 100 ppm nitrate.

The sample results show a connection between nitrate levels and geographic area. None of the samples collected in the Southwest and Eastern Districts exceeded the public drinking water standard. Conversely, more than 20 percent of the samples from the Northeast District and more than 30 percent of the samples from the Northwest District were above the standard. Individual counties in the Northwest identified as problem areas include Caldwell 7/20 (35 percent), Clinton 8/22 (36 percent), and Nodaway 42/106 (40 percent). The map below shows the percentage of wells above 10 ppm in each county where five or more samples were analyzed.

An attempt was made to gather more complete information on some of the wells from which samples were taken. Although limited data was collected, some patterns emerged. Most of the wells with elevated nitrate levels were dug wells. This supports the literature and the common belief that nitrate contamination is usually not a groundwater problem, but a problem of surface water infiltrating old wells. In our small survey, however, there were a number of drilled wells (8 out of 38, 21 percent) above 10 ppm. One of these wells was only a year old. This indicates there may be a large number of drilled wells in the state that were either improperly constructed or in deteriorated condition.

The majority of the samples sent to the laboratory were analyzed for other chemicals beside nitrates and that in many instances, nitrates were not the primary concern. This data, therefore, is not a random sample but is probably close to the actual percentage of private wells in the state that are contaminated. Some sanitarians, however, especially those in the Northeast District, have their own test kits and perform nitrate tests in their offices. Some of these sanitarians use their kits as screening tools, and only send a percentage of their water samples to the State Health Laboratory. Some of these sanitarians may be more likely to send high (or low) samples to Jefferson City which could bias the study.

The data collected indicates there is a risk of infant morbidity/mortality from nitrates in Missouri. There is a need for more consistent reporting, and for more well data. We need to determine the mechanisms most commonly responsible and to educate the public on proper well construction and private water supply protection. References available from the Bureau of Environmental Epidemiology, 800/392-7245. ■



Michael Klatt begins duties as Chief, Bureau of Immunization

Mike joins the Missouri Department of Health as chief of the Bureau of Immunization after holding the same position in South Dakota, Alaska and New Mexico. While in South Dakota, he concurrently held the position of STD Control Bureau Chief. Mike is an employee of the Centers for Disease Control assigned to the state.

Mike received a Bachelor of Science degree in biology from the University of South Dakota. He anticipates completing his Master of Science degree in community health education from the University of New Mexico this fall.

As bureau chief, Mike will attempt to reduce morbidity and mortality caused by vaccine-preventable diseases in Missouri by increasing the immunization levels in daycare centers, schools, colleges and universities by implementing appropriate and timely outbreak control measures. His immediate priorities will be to secure adequate funding for a routine second dose of measles vaccine and to increase the use of *Haemophilus b* Conjugate vaccine among children 15 months through 4 years of age. ■

Toddlers Drowning: Prevent It!

Erwin Gadd, Chief, Bureau of Community Sanitation

Young toddlers are curious, always exploring and getting acquainted with the world. The getting-acquainted process can subject this age group to conditions allowing for unusual accidents that parents and caregivers need to continuously monitor.

From 1985 to 1987, 67 drowning deaths caused by toddlers falling head first into buckets of liquid were reported by the U.S. Consumer Safety Commission. Most deaths occurred to children eight to12 months of age. It is believed that these drownings happened when curious infants crawled to buckets containing mop water or other liquids for household chores, pulled themselves up, and leaned forward to play in the water. When they toppled into the buckets, the children were unable to free themselves and drowned.

A five-gallon bucket is particularly dangerous even when only partially filled. Its heavier weight makes it more stable than a smaller bucket and, thus, less likely to tip over when a child uses it to pull up. The five gallon containers are commonly about half the height of these infants, and with three or more gallons of water, weigh more than most children that age.

The Missouri Department of Health warns that buckets of water or other liquids present a drowning hazard to small children. No bucket of liquid should be left unattended where small children may gain access to it. ■

Hepatitis Hot-Line

The Hepatitis Branch, Centers for Disease Control (CDC) has recently developed an automated telephone system to provide information on viral hepatitis. This "hepatitis hotline" contains general information on all types of hepatitis including risks, modes of transmission, prevention, serologic diagnosis, and infection control. Up-to-date statistics on incidence for the different types of hepatitis are also included. The information disseminated on the "hepatitis hotline" is comprehensive and will be a valuable public health tool in assisting anyone with questions regarding viral hepatitis. ***Hepatitis Hot Line (404) 332-4555.***

Salmonella Enteritidis: USDA Initiates New Regulations

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), recently notified the Bureau of Veterinary Public Health of new regulations to initiate nationwide control of *Salmonella enteritidis* (SE) in egg-laying chickens. The regulations provide the USDA with the authority to conduct flock testing following SE outbreaks in which eggs are implicated as a probable source.

These regulations are warranted to control the continuing increase of SE in this country. The prevalence of this serotype in humans has increased threefold nationally and tenfold in the northeastern United States in the last decade. (NOTE: there were 38 cases of SE reported to the Missouri Department of Health.) This trend shows no sign of abating. These increases in SE have been linked with the consumption of undercooked commercial graded shell eggs.

Physicians are encouraged to promptly report cases of SE which show eggs as a probable source to the Missouri Department of Health toll-free 800/392-0272. The cooperative effort of health and agriculture agencies will afford us the opportunity to reduce a major source of human salmonellosis. If you have questions, contact the Bureau of Veterinary Public Health at 314/ 751-6136.

Laboratory Identification of SE

Salmonella is a ubiquitous bacterium, divided into 65 subgroups and over 2,000 antigenically distinct serotypes. Some isolates of SE serotype enteritidis phage-type 4 are reported to be virulent and cause both human health and poultry industry problems in Europe. Confirming the presence of SE phage-type 4 is a multitiered testing process that begins when a local laboratory identifies salmonella in cultures of feed, water, litter, manure, or animal organs.

Cont'd...

Serotyping

Classifying each salmonella species into one of over 2,000 serotypes involves characterizing bacterial cell walls and flagellar antigens. Each salmonella serotype has its own antigenic structure, causing its own pattern of reactions with both somatic (cell wall or "O") and flagellar ("H") antigens. SE, for example, contains somatic antigens 1, 9, and 12 and flagellar antigens g and m. Antigenic structure is determined by agglutination tests.

Phage-Typing

Phage-typing is the most useful system currently available for distinguishing phage-type 4 from other SE types already present in the United States.

This system uses a battery of ten bacteriophages. Each known phage-type of SE creates a unique pattern of reactions to the ten phages.

Phage-type 4 reacts with all 10 reference phages, except number 1. It exhibits a moderate reaction with phages 2, 6 and 8 and a strong reaction with phages 3, 4, 5, 7, 9, and 10.

source: USDA *Salmonella enteritidis* FACT Sheet, March 1990

Laboratory Characterization of Salmonella Enteritidis

Isolates can be further characterized by the following tests:

Characteristic	Test(s)
• DNA composition and sequence	• Plasmid Profile Test
	• Restriction Endonuclease Analysis
• Susceptibility to antibiotics	• Antibiogram
• Susceptibility to bacteriophages	• Phage-typing

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Missouri EPIDEMIOLOGIST

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Second MMR Dose Recommended for Kindergarten Students and College Freshmen

The Missouri Department of Health now recommends that all entering kindergarten students and college freshmen for the 1990-91 school year have documentation of having received two doses of measles vaccine on or after the first birthday. These recommendations are derived from, and in accordance with, the recommendations of the Immunization Practices Advisory Committee (ACIP) as published in the December 29, 1989 *MMWR*. The Missouri Department of Health recently obtained funding to purchase sufficient MMR vaccine to provide this second dose of measles vaccine for those individuals in these two groups who receive their immunizations in the public sector.

This cohort approach to a revaccination effort for the citizens of Missouri was chosen for several reasons. First, a program of MMR immunization for everyone who could possibly benefit from a second dose of MMR vaccine would be extremely expensive, and the federal funding for a second dose was limited by Congress to $23.5 million for all 64 National Immunization Projects. Based on Missouri's experience with measles outbreaks in college-age students, this cohort was identified as a high-risk group, and crucial to the goal of prevention of outbreaks. Kindergarten students were designated by the ACIP as a high priority group for reimmunization since all states had the ability to reach this particular cohort due to school entry immunization requirements. The DOH cannot afford at this time to purchase additional vaccine but does not discourage private physicians or local health departments to provide MMR vaccine from other funding sources for other cohorts in line with either the AAP or ACIP guidelines.

For ease of implementing the kindergarten recommendation, the routine second dose of MMR vaccine should be administered simultaneously with the other two preschool immunizations (i.e., the fifth DTP and the fourth OPV) just as these three immunizations are recommended to be administered simultaneously at 15 months of age. All children who enter kindergarten this fall (1990-91 school year) should be strongly encouraged to get a second dose of MMR vaccine even though some of them may have already received the preschool DTP and OPV immunizations.

All college freshmen for the 1990-91 school year, who do not have documentation of having received two doses of measles vaccine on or after the first birthday, should be strongly encouraged to get the appropriate number of doses of MMR vaccine needed to meet this recommendation. Missouri's colleges and universities have varying preadmission immunization requirements for attendance and degrees of enforcement; therefore, the success of this recommendation is solely dependent upon the individual institutions of higher learning.

The Missouri Immunization Schedule is being revised to reflect inclusion of a routine second dose of MMR vaccine for preschoolers. The revised schedule will recommend a routine second dose of MMR vaccine for all children 4 to 6 years of age prior to school entry; and, furthermore, it will recommend that this routine second dose of MMR vaccine be administered simultaneously with the other two preschool immunizations.

Over the last couple of years it has become quite apparent that measles outbreaks can be sustained in populations that are highly immunized with a single dose of MMR vaccine. Providing a routine second dose of MMR vaccine to these two groups will greatly reduce the number of Missourians susceptible to measles and, thereby, diminish the potential for future measles outbreaks in our state. ■

Inside this Issue...

Outbreak of Foodborne Illness Due to *Clostridium perfringens* at a St. Louis, Missouri, School

Excerpted from a report submitted by Patricio Murgueytio, M.D.

Introduction

On Monday, October 9, 1989, the Missouri Department of Health and the City of St. Louis Health Division (SLHD) were informed of a suspected foodborne outbreak in a residential/day school. Approximately 20 residents had developed acute gastrointestinal symptoms on Sunday night and Monday. The SLHD began an investigation that day.

Background

The school serves a total of 107 students ranging from five to 21 years of age, including 47 residential students. Many of the students have physical and/or mental handicaps. There are six dormitories with limited meal preparation and serving capabilities. Meals are prepared in a central kitchen and are usually served in a central dining room.

Methods

Interviews were held with the supervisors of school health, residential services, and the food service. A tour of the dormitories and the health unit was made. A complete routine inspection was made of the food preparation area. Menus for the preceding two weeks were examined.

An event involving students from several other schools had been held at the affected school Saturday, October 7. The visiting students had eaten lunch on the premises, so the schools were contacted to see if anyone had become ill.

Eleven stool specimens were obtained from ten ill individuals within 24 hours of onset. Food samples and swabs of equipment and food preparation surfaces were collected. All testing was performed at the SLHD laboratory.

Plans to systematically interview the residents regarding food consumption could not be carried out, since most students were not capable of giving food histories.

Results - Epidemiological Evidence

The other schools whose students visited on October 7 reported no cases of gastrointestinal illness. Of the total of 47 resident students, 41 spent Sunday, October 8 at the school. They shared all meals in the dining room, except for dinner. Dinner, consisting of chili made from ground beef and beans, was prepared in the central kitchen and served in the dormitories. One staff member shared this meal.

The 41 students' ages ranged from 7 to 21 years, with a median of 16 years. Twenty-seven (68 percent) were male.

A total of 22 students and one staff member reported symptoms (attack rate=54.8 percent). Most cases became ill around 1:00 a.m. and the illness lasted 18 to 24 hours. Cases were distributed among five of the six dormitories. All cases had consumed the evening meal served in the dormitories.

All 23 cases had diarrhea with frequent, loose, mucoid stools (100 percent); fewer reported abdominal cramps (6 percent) and vomiting (4.3 percent). Fever was not reported in any of the cases.

Laboratory Results

Clostridium perfringens was isolated from all eleven clinical specimens. No quantitative analysis was performed. *Salmonella, Shigella, Campylobacter* and *Bacillus cereus* were not isolated from any of the specimens.

C. perfringens was also isolated from the samples of chili and ground beef. Swab cultures indicated coliform contamination on one of the cutting boards.

Food Service Inspection

Overall sanitary conditions in the central kitchen were very good. However, there was temperature abuse of the chili served for the evening meal on Sunday, October 8. The chili was cooked for about 30 minutes until approximately 2:30 p.m. It was then placed in plastic containers and left on the counter at room temperature to be picked up by the dormitory staff.

The chili was transported to the dormitories around 2:45 p.m., and left out at room temperature during the afternoon. It was then reheated and served in the affected dormitories between 5:00 and 5:30 p.m. In the unaffected dormitory, the chili was reheated at approximately 3:50 p.m. and served between 4:00 and 4:15 p.m.

Conclusions

The probable causative agent in this outbreak was C. *perfringens*. Clinical presentation of the cases was consistent with this agent, as was the median incubation period of eight hours. *C. perfringens* was isolated from all stool specimens submitted, from hamburger from the lot used to prepare the chili, and from leftover chili.

Clostridium species are spore-forming, obligate anaerobes. Some strains of *C. perfringens*, however, are aerotolerant, surviving oxygen exposure for up to 72 hours. Optimal growth occurs between 37°C and 45°C, with a generation time of eight minutes under ideal conditions.

This organism is widely distributed in nature, and is part of the normal intestinal flora of man. It is commonly found in meat and poultry products. Sporulation allows the organism to survive the initial cooking. The spores then germinate, and vegetative cells proliferate during slow cooling or reheating. Heat labile enterotoxins are formed during sporulation and released upon lysis of the cell in the intestine.

In this instance, the cooking process apparently was not adequate to destroy all the organisms present in the raw beef. The chili was then kept at room temperature for approximately 2.5 hours before it was reheated to an unknown temperature and consumed.

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■

Invasive *Haemophilus Influenzae* Disease Surveillance and Guidelines for Antibiotic Prophylaxis

Mahree Fuller Bright, M.A. and Irene Donelon, R.N., Bureau of Communicable Disease Control

Incidence

Haemophilus influenzae is a major cause of meningitis, epiglottitis, septic arthritis, bacteremia, cellulitis, pneumonia, and empyema in infants and young children. There are many less common manifestations as well, including purulent pericarditis, endocarditis, osteomyelitis, and peritonitis. Invasive diseases in infants and children are caused by encapsulated strains, nearly always type b (Hib)[1].

Hib causes approximately 8,000 - 11,000 cases of bacterial meningitis per year in the U.S.[2]; neurologic sequelae are common[3]. Hib meningitis was made reportable in Missouri in 1982; the annual reported incidence since that time is shown in Figure 1. During the first six months of 1990, 57 cases were reported. Other invasive Hib disease was made reportable during 1989; 16 cases were confirmed during the first six months of 1990.

Invasive Hib disease is most common in children 3 months to 3 years old, with a peak at 7 - 14 months. The exception is epiglottitis, which peaks at 2 - 4 years[4]. The age distribution of Missouri cases reported during the first six months of 1990 is shown in Figure 2.

HIB Immunization

The Immunization Practices Advisory Committee (ACIP) of the Centers for Disease Control recommends that all children receive Hib Conjugate vaccine at 15 months of age[6]. Comprehensive guidelines are available from the Bureau of Immunization. Vaccination is effective in preventing invasive disease but does not prevent nasopharyngeal carriage of Hib.

Prevention of Secondary HIB Disease

Secondary cases (illness within 1-60 days following contact with a child who has Hib disease) account for fewer than 5% of all invasive Hib disease. However, studies indicate there is increased risk of secondary cases in household and day care contacts[5].

Antibiotic prophylaxis is recommended for certain contacts of persons with invasive Hib disease by both the American Academy of Pediatrics and the ACIP. Since 1986, the Department of Health (DOH) has provided rifampin for this purpose. DOH guidelines for prophylaxis were recently revised and are summarized below[1,5]. For the complete recommendations, please contact the Bureau of Communicable Disease Control.

1. For purposes of prophylaxis, all forms of Hib disease are considered invasive except otitis media without sepsis. A positive nasopharyngeal, throat or sputum culture without sepsis is not considered invasive disease.

2. ***Oral rifampin is the drug of choice for Hib prophylaxis.*** The recommended dosage for children is 20 mg/kg once daily for 4 days (maximum, 600 mg per dose). The dose for very young infants is not established; dosage may be reduced to 10 mg/kg per dose for infants less than 1 month old. Dosage for adults is 600 mg once daily for four days. Rifampin suspension is not commercially available, but a liquid suspension can be prepared by a pharmacist from capsules.

3. The purpose of antibiotic prophylaxis is to eradicate nasopharyngeal carriage of the organism by contacts and therefore to protect other young children from invasive disease.

4. Only close contacts of the case, such as household members and day care contacts, should receive prophylaxis.

5. ***Household contacts.*** In a household in which a case of invasive Hib disease has occurred ***and in which another child younger than 48 months old resides***, all household members, including adults, should receive rifampin as soon as possible after diagnosis of the index patient. This should be done regardless of the children's immunization status.

Continued....

FIGURE 1

Haemophilus influenzae **type b Meningitis**
Missouri, 1982-1989

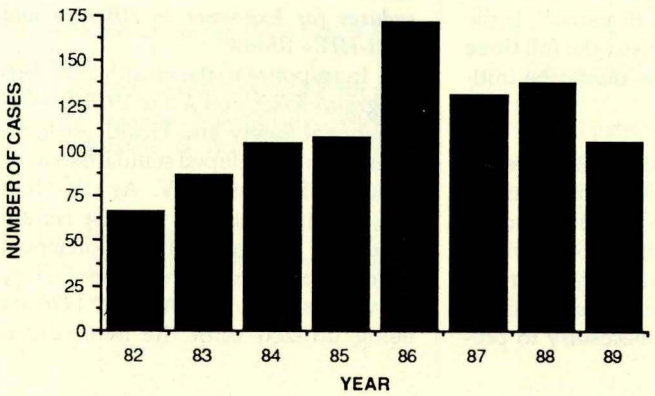
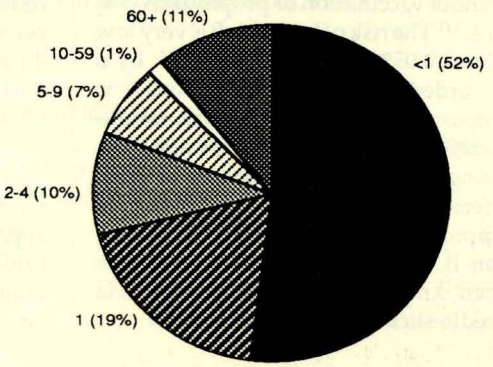


FIGURE 2

Haemophilus influenzae **Invasive Disease**
By Age Group, Missouri, January-June, 1990



6. ***Child Care Centers/Homes and Nursery Schools.*** *Prophylaxis is recommended only if there are contacts less than 24 months old and duration of contact was 25 hours or more per week.* Success depends upon prompt, strict compliance by attendees and supervisory personnel.

In child care homes resembling households where a case of invasive Hib disease has occurred, prophylaxis is recommended for all attendees and staff regardless of age or immunization status.

In a child care classroom where a case has occurred, rifampin prophylaxis should be strongly considered for all children and staff in the classroom, regardless of age or immunization status.

When two or more cases of invasive Hib disease have occurred among day care attendees within 60 days, all attendees and supervisory personnel should receive prophylaxis. Families of staff and attendees do not require prophylaxis unless they are also contacts of the case.

7. ***Timing.*** Rifampin prophylaxis should be instituted as rapidly as possible and no later than 14 days after last contact with the case.

8. ***Convalescent patients.*** The antibiotics commonly used for treatment of systemic Hib disease do ***not*** eradicate nasopharyngeal carriage. All convalescent patients who are anticipated to resume close contact with other young children, at home or in child care, should receive rifampin immediately after completing treatment for Hib disease.

Availability of Rifampin From DOH

Rifampin is available from DOH for prophylaxis of individuals who meet the above guidelines. For more information or to report cases of communicable diseases, contact your district Communicable Disease Coordinator or the Bureau of Communicable Disease Control reporting line, 800/392-0272.

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Recommendations for Needle-Stick, Puncture Wounds and Mucocutaneous Blood and Body Fluid Exposure in Health Care Workers

Revised September 1990

Caryl Collier, R.N., M.P.H., C.I.C., Bureau of Communicable Disease Control

Introduction

Needle-stick injuries account for a large number of the work-related accidents reported in hospitals (yearly rate ranging from 75-150 per 1000 employees in teaching hospitals).[12] Underreporting of needle-stick injuries has been documented as high as 75%.[2]

The risk of acquiring hepatitis B virus (HBV) through an accidental puncture wound from a needle used on an HBsAg-positive patient for a worker without vaccination or prophylaxis is 6-30%.[3,11] The risk of hepatitis B is very low (about 0.05%) in personnel stuck by a discarded needle where the source is unknown. The risk of human immunodeficiency virus (HIV) infection from a single needle-stick exposure to HIV-infected blood is between 0.4 - 0.5%, (approximately 1 in 200).[4,13,14,15] Non A, non B hepatitis (hepatitis C) has also been known to be transmitted via needle-stick exposures.[5-7]

General Prophylaxis When Needle-Stick or Sharp Injury Occurs

All puncture wounds should be cleansed vigorously and the person should be instructed to seek medical care at the first sign of bacterial infection. Needle-stick injuries are not tetanus-prone wounds;[8] however, a needle-stick injury is a good time to ascertain the person's tetanus immune status and to offer prophylaxis if indicated.[9] Consider offering a tetanus and diphtheria toxoids (Td) booster if the person has not received a booster in 10 years.[10] If the person has never received the full three dose series of Td, this should be initiated.[10]

For those rare documented needle-stick exposures to other potentially transmittable diseases, such as active syphilis or acute malaria, prophylaxis can be decided individually, in consultation with an infectious disease specialist. It is probably unnecessary to provide routine antibacterial prophylaxis for puncture wounds from needles used in patients with bacterial sepsis; the risk of transmission of infection is extremely low. It is far more likely that those rare bacterial infections originating from needle-stick injuries derive from inoculation of the person's own skin flora into the tissues at the time of the needle-stick.[8]

Occupational Safety and Health Administration (OSHA) Enforcement Procedures for Exposure to HBsAg+ and Anti-HIV+ Blood[16]

In response to the Health Omnibus Programs Extension Act of 1988, the Occupational Safety and Health Administration has developed standards for exposure to HBV and HIV. As a result of rule making petitions against certain aspects of the standards, "enforcement procedures" based on General Duty Provisions of the OSHA Act of 1970 are being utilized until the new rule is

Table 1.
Recommended Doses and Schedules of Currently Licensed HB Vaccines[47]

Group	Vaccine		
	Heptavax-B[1] Dose (ml)	Recombivax HB[1] Dose (ml)	Engerix-B[1,2] Dose (ml)
Children and adolescents 11-19 years	20 ug (1.0)	5 ug (0.5)	20 ug (1.0)
Adults > 19 years	20 ug (1.0)	10 ug (1.0)	20 ug (1.0)
Dialysis patients and other immuno-compromised persons	40 ug (2.0)[3]	40 ug (1.0)[4]	40 ug (2.0)[5]

Footnotes
1. Usual schedule: Three doses at 0, 1, 6 months. Available only for hemodialysis and other immunocompromised patients and for persons with known allergy to yeast.
2. Alternative schedule: Four doses at 0, 1, 2, 12 months
3. Two 1.0 ml doses given at different sites at 0, 1, 6 months
4. Special formulation for dialysis patients
5. Four-dose schedule recommended at 0, 1, 2, 6 months with two 1.0 ml doses given at different sites.

promulgated. The "enforcement procedures" state that after consent is obtained from the individual from whom exposure occurred, a blood sample should be drawn from this source person and tested for HBsAg and HIV antibody. Management of the exposed individuals should take into account:

a. HBV vaccination and vaccine response status of the exposed person.
b. Whether the source of blood is available.
c. The HBsAg and HIV status of the source.

See Tables 1, 2, 3, 4 for recommendations following percutaneous and permucosal exposure.

Documentation on OSHA 200 form is mandated whenever exposure by percutaneous injury (needle-sticks) requires medical treatment other than first aid.

Recommendations for Hepatitis B Prophylaxis [17]

Two products are available for prophylaxis against hepatitis B: vaccine and hepatitis B immune globulin (HBIG).

1. *Vaccine.* Vaccination provides active protection against hepatitis B and should be provided pre- or post-exposure for health care workers at risk of HBV infection. Three vaccines are available: 1) an inactivated plasma-derived type, (Heptavax-B). Since June 1989, this is only available for patients who are immunosuppressed, on dialysis or allergic to yeast. 2) Recombivax HB and 3) Engerix-B. (See Table 1) The vaccine administered into the deltoid muscle is 80-95% effective in preventing infection or clinical hepatitis in those who receive the complete course. Optimal protection is not conferred until after the third dose. If the vaccine series is interrupted after the first dose, the second and third doses should be given separated by an interval of 3 to 5 months. Persons who are late for the third dose should be given this dose when convenient.

Testing for immunity following vaccination is not recommended routinely but is advised for persons whose subsequent management depends on knowing their immune status, such as dialysis patients and staff, and persons in whom a suboptimal response may be anticipated, such as those who have received vaccine in the buttock, persons >50 years of age, and persons known to have HIV infection. ***Post-vaccination testing should also be considered for those at occupational risk who may have frequent needle-stick exposures necessitating post-exposure prophylaxis.*** When necessary, post-vaccination testing should be done between 1 and 6 months after completion of the vaccine series.

For health care workers with normal immune status, booster doses of vaccine are not recommended on a routine basis. A booster is sometimes needed following known exposure to HBsAg. See Table 3 for recommendations regarding post-exposure serologic testing and vaccine boosters.

2. ***Hepatitis B Immune Globulin (HBIG):*** For temporary post-exposure prophylaxis. Contains high titers of >100,000 anti-HBs by radioimmunossay (RIA). This is the preferred product when passive immunization is indicated, but it is very expensive.

The efficacy of immune globulin (IG) for postexposure prophylaxis is uncertain. IG no longer has a role in postexposure prophylaxis of hepatitis B because of the availability of HBIG and the wider use of hepatitis B vaccine.

Continued...

Table 2. Recommendations After Percutaneous Exposure to Known Parenterally Transmitted Hepatitis C (HCV) [47]

Exposed Person	Source
Administration of immunoglobulin (IG) is recommended for needle-stick exposures involving the blood or body fluids of patients known to have hepatitis C Dose: 0.06 ml/kg administered as soon as possible after injury.	Hepatitis C acute or carrier state

Recommendations for Hepatitis C (HCV) Prophylaxis

Although effectiveness has been equivocal in several studies, IG is recommended following percutaneous exposure to known HCV[17] (See Table 2).

Recommendations for Protection Against Delta Hepatitis (HDV) [17]

Since HDV is dependent on HBV for replication, prevention of hepatitis B infection, either pre-exposure or post-exposure, will suffice to prevent HDV infection for a person susceptible to hepatitis B. No products are available that might prevent HDV infection in HBsAg carriers either before or after exposure.

Recommendations for HIV Postexposure Evaluation and Counseling of Workers [18] (See Table 4)

Definition of occupational exposure to HIV: an occupational exposure (i.e., exposure that occurs during the performance of job duties) that may place a worker at risk of HIV infection is a percutaneous injury (e.g., a needle-stick or cut with a sharp object), contact of mucous membranes, or contact of skin (especially when the exposed skin is chapped, abraded, or afflicted with dermatitis or the contact is prolonged or involving an extensive area) with blood, tissues, or other body fluids to which universal precautions apply, including: a) semen, vaginal secretions, or other body fluids contaminated with visible blood because these substances have been implicated in the transmission of HIV infection; b) cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid because the risk of transmission of HIV from these fluids has not yet been determined; and c) laboratory specimens that contain HIV (e.g., suspensions of concentrated virus). Occupational transmission of HIV has ***not*** been documented to occur with exposure to intact skin.

Employers should make serologic testing available to all workers who are concerned about possible infection with HIV through an occupational exposure. A few drops of blood on intact skin is not considered an exposure capable of causing transmission of HIV. When an exposure occurs, the following procedure should be carried out:

For source individual
- Inform of the incident
- Obtain consent for serologic HIV testing
- If unable to give consent, obtain from relative or significant other
- Provide pre-test counseling
- Test for anti-HIV if consent obtained

For exposed worker
- Obtain consent for serologic HIV testing and draw blood
- Provide pre-test counseling
- Evaluate clinically as soon as possible.
- Evaluate serologically for evidence of HIV infection if source refuses test, has AIDS or is anti-HIV+.

Confidentiality of the source individual and the worker should be maintained at all phases of evaluation and follow-up.

See Table 4.

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For copies of the document, including a complete list of references, write to: Bureau of Communicable Disease Control, Missouri Department of Health, P.O. Box 570, Jefferson City, Missouri 65102 or call, in Missouri, (800) 392-0272 or, outstate Missouri, (314) 751-6115.

Assistance Provided by: JoAnn Rudroff, Mahree Fuller Bright, M.A., H. Denny Donnell, Jr., M.D., M.P.H., Todd F. Baumgartner, M.D., M.P.H., Mary Bush, R.N., Irene Donelon, R.N., Lisa Speissegger, B.S., Barbara Dunn, R.N.■

TABLE 3. RECOMMENDATIONS FOR HEPATITIS B PROPHYLAXIS FOLLOWING PERCUTANEOUS OR PERMUCOSAL EXPOSURE[47]

I. Notify source of worker exposure, obtain consent if necessary, and test source for HBsAg.
II. Check worker record for history of hepatitis B, vaccination against HBV, and anti-HBs level.
III. Assure test results for HBsAg and anti-HBs are available within 7 days of exposure.

	Management of worker when source is:		
Exposed Person	HBsAg+	HBsAg -	Source not Tested or Unknown
Unvaccinated	HBIG x 1 * and initiate HB vaccine **	Initiate HB vaccine**	Initiate HB vaccine**
Incomplete vaccine series	HBIG x 1 * and complete HB vaccine series as scheduled**	Complete HB vaccine series as scheduled**	Complete HB vaccine series as scheduled**
Previously vaccinated Known Responder	Test exposed for anti-HBs unless tested within past 24 months. If inadequate***, HB vaccine booster dose** If adequate, no treatment	No treatment	No treatment
Known Nonresponder	HBIG x 2* (immediately and 1 month later) **OR** HBIG x 1* plus 1 dose HB vaccine**	No treatment	If known high risk source, may treat as if source were HBsAg+
Response Unknown	Test exposed for anti-HBs unless tested within past 24 months 1. If inadequate***, HBIG x 1* plus HB vaccine booster dose** 2. If adequate, no treatment	No treatment	Test exposed for anti-HBs unless tested within past 24 months 1. If inadequate***, HB vaccine booster dose** 2. If adequate, no treatment

* HBIG dose 0.06 ml/kg preferably within 24 hours of exposure; can be given up to 7 days post exposure
** HB vaccine dose - See Table 1; IM at different site from HBIG site; first dose within 7 days of exposure.
*** Adequate anti-HBs is $\geq$ 10 milliInternational Units (mIU)/ml, approximately equivalent to 10 sample ratio units (SRU) by radioimmunoassay (RIA) or positive by enzyme immunoassay (EIA)

TABLE 4. RECOMMENDATIONS FOR HIV POST-EXPOSURE TESTING, COUNSELING AND PROPHYLAXIS OF WORKERS [46]

I. Counsel worker. Worker should consent to clinical evaluation and drawing blood for baseline HIV testing at time of exposure.* Hold frozen aliquot of worker blood to test at a later date for pre-existing HIV.**

II. Source should receive pre-test counseling ** and, if consent obtained, be tested for HIV antibody.*

III. Test worker's blood if source refuses test, has AIDS or is anti-HIV+.

Management of worker for follow-up counseling and testing if source is:

Anti-HIV seropositive or Diagnosed with AIDS or Refuses Testing	Anti-HIV seronegative and No Clinical Manifestations of AIDS or HIV Infection	Source not tested or Unknown
1. Counsel exposed worker regarding**: a. Risk of HIV infection; b. Need to report any febrile illness, rash, myalgia, fatigue, malaise or lymphadenopathy, especially within first 6-12 weeks; c. Need to prevent potential transmission of HIV during incubation period, especially during first 12 weeks; e.g., barrier technique for sexual contacts; refrain from donating blood, semen or organs; refrain from breast feeding. 2. If exposed worker is seronegative, retest in 6 weeks, 12 weeks, and 6 months. 3. When source is known to be anti-HIV positive or has AIDS at time of worker's exposure, counsel worker about considerations pertaining to use of zidovudine prophylactically. No data are available to determine efficacy or toxicity of various regimens. See reference #46. 4. Consider potential enrollment in various prospective studies - zidovudine prophylaxis for "massive exposure" to HIV (800) 537-9978; CDC prospective surveillance system (404) 639-1644. See reference #46.	No further follow-up necessary; however, follow-up testing at 12 weeks may be done if: 1. Epidemiologic evidence suggests the source individual may have recently been exposed to HIV; 2. Repeat testing is desired by the worker; 3. Repeat testing is recommended by the health-care provider.	A decision to do follow-up testing should be individualized. Follow-up testing may be done if: 1. Source may have been at increased risk of HIV infection; 2. Repeat testing is desired by the worker; 3. Repeat testing is recommended by the health-care provider.

* Test according to procedure on page 12.

** Components of pre-test and post-test counseling noted in Consultation Rule (19 CSR 20-26.030). See Appendix A.

Tuberculosis - Yes! It's Still a Problem!

(The following TB Fact Sheet is reprinted with permission of the Centers for Disease Control.)

The recent increase in tuberculosis (TB) cases nationwide is due in large part to HIV infection. From 1985 through April 1990, a total of 35 individuals in Missouri were reported with a diagnosis of AIDS and tuberculosis. For the same time frame a total of 57 individuals were reported with mycobacterial disease other than tuberculosis as well as AIDS. Awareness of the connection between tuberculosis and HIV infection is essential to the control and eventual elimination of tuberculosis by the year 2010.

Eight million new cases of TB occur each year around the world. In the United State (US), the 30-year decline in TB cases has ended. Since 1985, the number of US cases reported each year has remained above 22,000; this represents almost 15,000 more cases reported than expected. The epidemic of HIV infection is at least in part responsible for these excess cases.

An estimated 10-15 million persons in the U.S. are infected with the TB bacillus.

Tear off for future reference.

Who gets TB?

Anyone can, but those at higher risk include contacts of known cases, the poor, the homeless, the foreign-born from high prevalence areas, nursing home residents, prisoners, intravenous drug users (IVDUs) and ***especially persons with HIV infection.***

Diagnosis

A high index of suspicion for TB should be maintained; order appropriate microscopy and cultures.

--TB can affect any organ, but the lung is the most common site.

--A negative TB skin test does not rule out TB.

--The Mantoux test is the preferred method for skin testing.

A positive acid-fast smear is an indication for TB treatment, but may indicate "nontuberculous" mycobacterial disease. Culture is the only definitive proof of the diagnosis.

All persons with TB or TB infection need to be assessed for HIV infection since medical management is altered in the presence of HIV infection (***see TB and HIV section***). These persons should be offered counseling and HIV-antibody testing.

Treatment for HIV-negative persons

The preferred treatment regimen for previously untreated cases is a 6 month regimen of isoniazid (INH), rifampin (RIF) and pyrazinamide (PZA). (The latter drug is given for the first 2 months only.)

INH resistance should be suspected in those from developing countries or with a history of prior therapy; add a fourth drug (ethambutol) to the regimen, and order drug susceptibility tests.

Noncompliance should be monitored with patient interviews, pill counts and urine tests.

Patient incentives and enablers should be used to improve patient compliance.

Noncompliant persons should be given twice-weekly directly observed therapy (DOT). Health care providers can request health department staff to provide DOT.

Treatment should continue for a minimum of 6 months and for at least 3 months after cultures become negative.

Prompt reporting of suspected cases to the local health department is very important to ensure that contact investigation is done and that noncompliant persons are placed on supervised therapy.

Five to ten percent of persons with tuberculosis die from their disease, but TB is curable if the diagnosis is made and appropriate treatment is instituted early.

Prevention for HIV-negative persons

TB is spread through airborne droplet nuclei produced by persons with respiratory tract disease (lungs and/or larynx). Individuals who share the same airspace with the TB case are at greatest risk of exposure and infection. They should be skin tested and given a chest radiograph if their test is positive or if they have symptoms.

Infected contacts and other high risk persons who are HIV negative should be given INH (10 to 15 mg/kg up to 300 mg daily) for at least 6 months.

High risk persons with positive skin tests for whom INH preventive therapy is indicated, regardless of age, include:

1. Persons with known or suspected HIV infection; (***see TB and HIV section***)
2. Persons with abnormal chest radiographs compatible with old inactive tuberculosis;
3. Persons with recent tuberculin skin test conversion;
4. Foreign-born persons from high prevalence areas who have recently entered the United States;
5. Persons who are intravenous drug users;
6. Persons with medical conditions that have been reported to increase the risk of tuberculosis, such as: silicosis, gastrectomy, chronic renal failure, diabetes mellitus, immunosuppressive therapy, malignancies and other conditions in which immunosuppression results.

Also, all other persons with positive skin tests who are less than 35 years of age should be considered for preventive therapy, especially persons from low income minority populations; residents and staff of long term care facilities, e.g., prisons and nursing homes; children and adolescents; and employees in facilities serving large numbers of susceptible persons, e.g., newborn nurseries.

Persons placed on INH preventive therapy should be monitored monthly for compliance and side effects (especially signs and symptoms of hepatitis).

The key to preventing TB infection and death and disability from TB disease is to consider the possibility of TB and make the diagnosis as quickly as possible.

TB and HIV - What is the Connection?

HIV infection weakens the body's immune system and makes it more likely for a person with latent TB infection to develop active TB. HIV infection is one of the strongest known risk factors associated with the progression from TB infection to active TB.

HIV-related TB is unique in that it is one of the few clinical manifestations of HIV infection that is communicable, treatable and preventable.

All TB patients should be tested for antibodies to HIV. Ideally, HIV-antibody testing and counseling should be provided in the same location where TB testing and treatment occur. If not feasible, clinics and alternative testing sites can also perform this service, but there must be effective followup and referral methods in place to link HIV counseling/testing and TB treatment centers.

Diagnosis for HIV-positive persons

All persons who are HIV seropositive should have a Mantoux tuberculin skin test.

All persons with or at risk for HIV infection (especially IVDUs) should be given a TB skin test.

Persons with both HIV and TB infections may have falsely negative skin test reactions because of immunosuppression.

Health care providers of HIV-infected persons must be aware that TB may present in unusual ways in this group (for example, with TB in the lymph nodes or in the lower portion of the lung).

Treatment for HIV-positive persons

Persons with both active TB and HIV infection respond well to TB treatment. However, treatment should be given for a longer period of time than the standard regimens used for persons with TB who are HIV seronegative.

Treatment should last for a minimum of 9 months and for at least 6 months beyond the date when cultures become negative.

If either INH or RIF is not, or cannot be, included in the regimen, therapy should last for at least 18 months and for a minimum of 12 months following culture conversion.

Preventive therapy for HIV-infected persons should also be given for a longer period of time than the regimens used for persons not infected with HIV (INH for 12 months instead of 6 months.)

Infection Control

All persons with HIV infection and undiagnosed pulmonary disease should be suspected of having TB. Appropriate precautions to prevent airborne transmission should be taken until TB is diagnosed and treated or ruled out.

These precautions are most important during and immediately after procedures that may induce coughing, such as bronchoscopy, sputum collection, aerosol induction of sputum and administration of aerosolized medications such as pentamidine.

Health care workers who have regular contact with persons with TB or HIV infection should participate in an ongoing TB screening program.

Additional copies can be obtained by calling your local health department or the Bureau of Tuberculosis Control, 314/751-6122. ■

State Public Health Laboratory News...

Newborn Screening -- Hypothyroidism, PKU, Galactosemia and Hemoglobinopathies

James Baumgartner, BS, MBA, Chief, Metabolic Disease Unit

	Mar 90	Apr 90	Total YTD
Specimens: Tested	8927	8930	50344
Initial (percent)	78.3	76.6	39841
Repeat (percent)	21.7	23.0	10503
Specimens: Unsatisfactory	126	110	1053
HT Borderline	21	34	273
HT Presumptive Positive	7	5	32
PKU Borderline	17	34	102
PKU Presumptive Positive	2	2	7
GAL Borderline	11	32	54
GAL Presumptive Positive	2		2
FAS (Sickle cell trait)	82	105	564
FAC (Hb C trait)	27	26	146
FAX (Hb variant)	10	13	56
FS (Sickle cell disease)	3	5	21

Congenital Syphilis

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Raymond L. Bly, Chief, Bureau of Sexually Transmitted Diseases

Congenital syphilis has increased steadily in the United States since 1983 when 129 cases were reported to a high of 925 cases in 1989. The majority of these cases occurred in California, Florida, New York, Pennsylvania, Tennessee, and Texas. These areas are also reporting large numbers of primary and secondary syphilis.

In Missouri, reported cases of congenital syphilis have remained at a low level. In CY 1980, one case was reported and in 1989, no cases were reported. The average number of congenital cases reported each year during this 10 year period was 1.6 cases per year.

For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis in infants and children, as well as syphilitic stillbirths

The new congenital syphilis reporting guidelines, which have been approved by the Council of State and Territorial Epidemiologists (CSTE) and the Centers for Disease Control (CDC), have been adopted by the Missouri Department of Health and are listed below. These guidelines are effective immediately. They are more sensitive than previous guidelines and include all stillbirths as well as live births and are expected to increase the number of cases reported when this procedure is implemented.

New Congenital Syphilis Case Definition :

For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis in infants and children, as well as syphilitic stillbirths. A ***Confirmed Case of Congenital Syphilis*** is an infant in whom Treponema pa*llidum* is identified by darkfield microscopy, fluorescent antibody, or other specific strains in specimens from lesions, placenta, umbilical cord, or autopsy material.

Presumptive Case of Congenital Syphilis is either of the following:

A. Any infant whose mother had untreated or inadequately treated[1] syphilis at delivery, regardless of findings in the infant; or

B. Any infant or child who has a reactive treponemal test for syphilis and only one of the following:

1. Any evidence of congenital syphilis on physical examination[2]; or
2. Any evidence of congenital syphilis on long bone x-ray; or
3. Reactive cerebrospinal fluid (CSF) VDRL[3]; or
4. Elevated CSF cell count or protein (without other cause)[3]; or
5. Quantitative nontreponemal serologic titers which are fourfold higher than the mothers (both drawn at birth); or
6. Reactive test for FTA-ABS-19S-IgM antibody[3].

A ***Syphilitic Stillbirth*** is defined as a fetal death in which the mother had untreated or inadequately treated[1] syphilis at delivery of a fetus after a 20-week gestation or of >500 grams.

Footnotes:

[1] Inadequate treatment consists of any non-penicillin therapy or penicillin given less than 30 days prior to delivery.

[2] Signs in an infant (<2 years) may include hepatosplenomegaly, characteristic skin rash, condyloma lata, snuffles, jaundice (syphilitic hepatitis), pseudoparalysis, or edema (nephrotic syndrome).

Stigmata in an older child may include: interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson's teeth, saddle nose, rhagades, or Clutton's joints.

[3] It may be difficult to distinguish between congenital and acquired syphilis in a seropositive child after infancy. Signs may not be obvious and stigmata may not yet have developed. Abnormal values for CSF VDRL, cell count, and protein, as well as IgM antibodies, may be found in either congenital or acquired syphilis. The decision may ultimately be based on maternal history and clinical judgment; the possibility of sexual abuse also needs to be considered. ■

If you have questions or need clarification on these guidelines, call the Bureau of Sexually Transmitted Diseases, 314/751-6141.

Optimum Needle Length for Diphtheria-Tetanus-Pertussis Inoculation of Infants

Hick JF, Charboneau JW, Brakke DM, Goergen B. Pediatrics 1989;84 (1):136-137
Excerpted from the Vaccine Bulletin, 1989.

Physicians from the Mayo Clinic, Rochester, Minnesota, conducted a study of the most appropriate needle length for injection of diphtheria-tetanus-pertussis (DTP) vaccine in infants. This investigation was undertaken because there has been no consensus on the most appropriate needle length for DTP immunization in infants.

The 1982 *Report of the Committee on Infectious Diseases* (Red Book) recommended intramuscular (IM) administration of DTP with 2.54 to 3.17-cm (1-to 1 1/4-inch) needle. But in 1986, this recommendation was deleted from the Red Book, although IM administration was still suggested.

A comprehensive review of IM injection techniques by Bergeson and colleagues, published in *Pediatrics* in 1982, recommended a 2.54-cm needle tilted at a 45 degree angle to the long axis of the leg for the DTP innoculation. The 45 degree angle was recommended so that the femoral artery would not be compromised.

To determine what needle length for DTP immunization was used in currrent practice, John F. Hick, M.D., and colleagues conducted a survey of the five largest pediatric clinics in their area. Four of the five facilities used 1.58-cm (5/8-inch) needles for DTP vaccination.

To make an objective recommendation on needle length for DTP immunization, Dr. Hick and co-investigators used ultrasonography to examine the depth of the fat layer over the anterolateral thigh, which is the recommended injection site for DTP. The skin-to-muscle depth and the skin-to-bone depth were recorded for all of the 24 four-month-old infants included in the study.

For the four-month-old boys, the mean skin-to-muscle depth was 1.4 ± 0.24 cm, while the skin-to-bone depth was 3.2 ± 0.45 cm. In the infant girls, corresponding measurements were 1.3 ± 0.28 cm and 2.8 ± 0.47 cm, respectively.

They found that if a 1.58-cm needle was injected at a 45 degree angle, the muscle layer would have been penetrated in only five (21%) of the 24 subjects. In contrast, if a 2.54-cm needle at a 45 degree angle was used, the muscle would be penetrated in all of the infants.

Some physicians suggest that DTP be given IM in the anterolateral thigh with a 1.56-cm (5/8-inch) needle at a 90 degree angle to the longitudinal axis of the leg. However, in this study, IM penetration would not have occurred in 25 percent of the study participants using this approach.

Responding to concern that the 2.54-cm (one-inch) needle might occasionally strike the femur, these investigators point out that with reference to the skin-to-bone depth of the study participants, this theoretically would not have occured in any subjects. They suggest manually bunching the tissue at the injection site in the recommended fashion to increase muscle depth and minimize the chance of striking bone in infants younger than four months.

Use of the one-inch needle eliminated sterile abscesses at the injection site, which were seen on an occasional but regular basis with the 5/8-inch needle.

These investigators concluded that their study upholds previous recommendations that 2.54-cm (one-inch) is the preferred needle length for IM injection of DTP vaccine in infants. ■

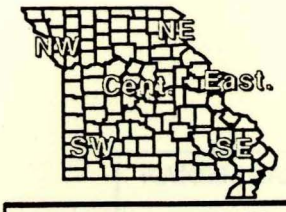
Pilot Project for Reporting Environmental or Occupational Exposures and Illnesses

July 1, 1990, was the starting date for an 18 month pilot study project within the Northeastern District. The purpose of the study is to acquire data on environmental or occupational exposures and illness, to promote epidemiological investigations, and to evaluate the data reporting system. The Bureau of Environmental Epidemiology (BEE) has the capability to conduct intervention activities where appropriate and a strong interest in doing so. The bureau firmly believes occupational and environmental illnesses are largely unnecessary and preventable. Information on the nature, extent, and location of the potential problem areas is needed to focus prevention efforts.

The pilot study will be limited to instances of lead, nitrate, or pesticide poisoning and reporting will be accomplished within the normal communicable disease reporting framework. Such reports are currently required under 19 CSR 20-20.020. Therefore, this study is one of special emphasis on selected exposures, rather than a new reporting requirement.

The NE District communicable disease coordinator, Robert Maley, will act as the contact person for medical care providers and will be able to furnish information on the study and respond to questions. The Bureau of Environmental Epidemiology will furnish information on the substances, including background levels, levels of concern, and health effects. Articles on lead, nitrates, and pesticides will be featured in upcoming issues of the *Missouri Epidemiologist*.

For further information, contact Bob Maley, Northeastern District Health Office, 816/385-3125, or Stephen Meek, Toxicologist, 314/ 751-6102. ■



Missouri Department of Health
Disease Prevention - Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period *
May & June 1990

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	2 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1990	1989	FOR 1990	FOR 1989	5 YR MEDIAN
Vaccine Preventable Dis.																
Chickenpox	990	155	118	507	329	332	0	0	22	376	8	2837	1448	8798	6667	6667
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Influenza	0	0	0	0	0	0	0	0	0	0	0	0	2	215	245	72
Measles	4	1	0	8	0	0	0	1	0	2	1	17	38	76	304	23
Mumps	0	0	1	3	0	2	0	0	0	0	0	6	11	43	49	19
Pertussis	1	1	1	0	2	2	0	0	0	4	0	11	17	31	27	13
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Viral Hepatitis																
A	21	4	2	8	2	3	0	27	6	4	1	78	139	279	337	83
B	16	2	22	8	4	9	0	27	12	19	4	123	133	306	342	218
Non A - Non B	2	1	1	1	1	4	0	3	0	1	0	14	9	24	23	20
Unspecified	1	0	0	2	0	1	0	0	0	0	0	4	1	11	3	8
Meningitis																
Aseptic	4	1	4	1	2	5	0	3	2	5	1	28	20	56	40	28
H. influenza	3	2	4	6	0	0	0	3	1	3	1	23	21	57	52	67
Meningococcal	2	1	1	0	3	0	0	0	0	0	0	7	4	19	11	23
Other	1	1	1	5	1	2	0	1	0	0	0	12	5	37	28	30
Enteric Infections																
Campylobacter	11	1	14	18	9	7	0	11	4	14	20	109	116	212	214	115
Salmonella	7	6	16	8	10	23	0	10	14	32	5	131	127	263	295	257
Shigella	1	0	9	2	5	9	0	12	4	3	0	45	89	95	222	60
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Parasitic Infections																
Amebiasis	0	0	1	0	0	1	0	0	0	1	1	4	1	8	8	11
Giardiasis	12	7	14	4	6	15	0	10	7	10	3	88	112	280	270	184
Toxoplasmosis	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	8
Sexually Transmitted Dis.																
AIDS	11	0	2	0	2	3	4	36	27	5	3	93	40	266	158	75
Gonorrhea	89	14	84	85	32	21	0	746	1579	573	42	3265	3367	10093	8871	8871
Genital Herpes	34	10	84	20	19	22	0	88	177	110	25	589	393	1676	1150	922
Nongonoc. urethritis	13	6	30	8	2	2	0	277	796	329	3	1466	1186	3572	3325	3702
Prim. & Sec. syphilis	2	1	3	3	0	0	0	20	11	6	0	46	20	107	67	61
Tuberculosis																
Extrapulmonary	0	0	0	0	1	1	0	1	1	2	0	6	10	18	18	23
Pulmonary	7	1	5	6	3	3	1	4	15	5	0	50	43	116	97	115
Zoonotic																
Animal Bites	302	93	93	172	116	173	0	0	0	451	27	1427	574	2949	1928	1559
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Rabies (Animal)	0	1	2	2	0	0	0	0	0	0	0	5	12	15	32	28
Rocky Mtn. Sp. Fever	0	0	1	4	5	0	0	0	0	0	0	10	25	12	25	5
Tularemia	0	1	4	2	1	0	0	0	0	0	2	10	11	13	14	14

Low Frequency Diseases

Anthrax
Botulism
Brucellosis
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious) - 2
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 2
Legionellosis - 3
Leptospirosis
Lymphogranuloma Venereum
Malaria - 2
Plague
Rabies (human)
Reye's Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome
Trichinosis

Outbreaks

Foodborne/Waterborne - 3
Histoplasmosis
Nosocomial
Pediculosis
Scabies
Other - 3

*Reporting Period Beginning April 30, Ending June 30.

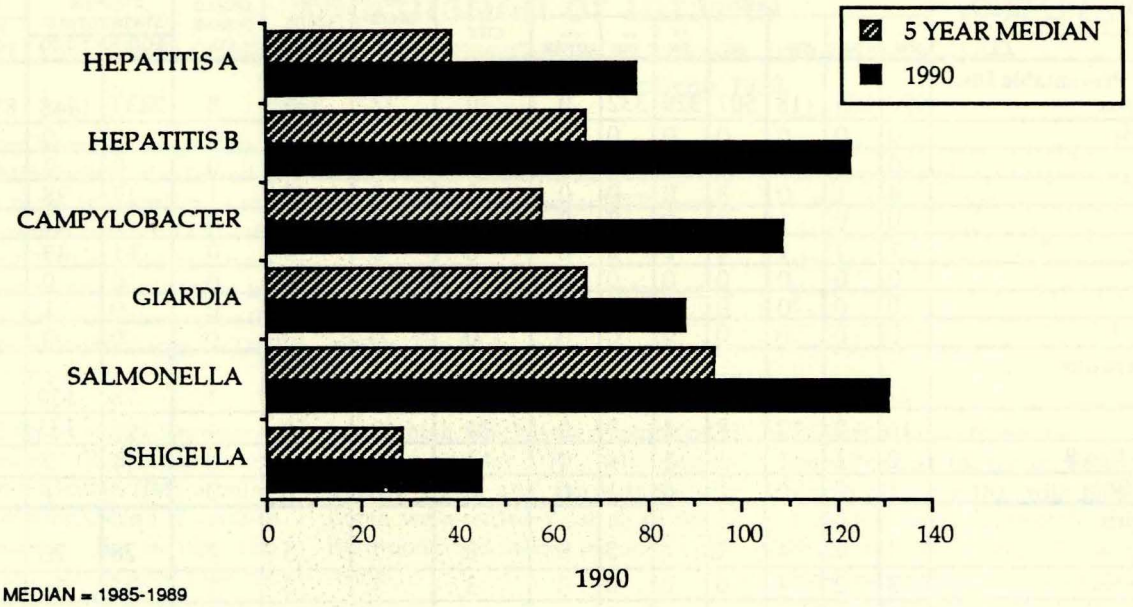
**Totals do not include KC, SLC, SLCo, or Springfield

***State and Federal Institutions

Due to data editing, totals may change.

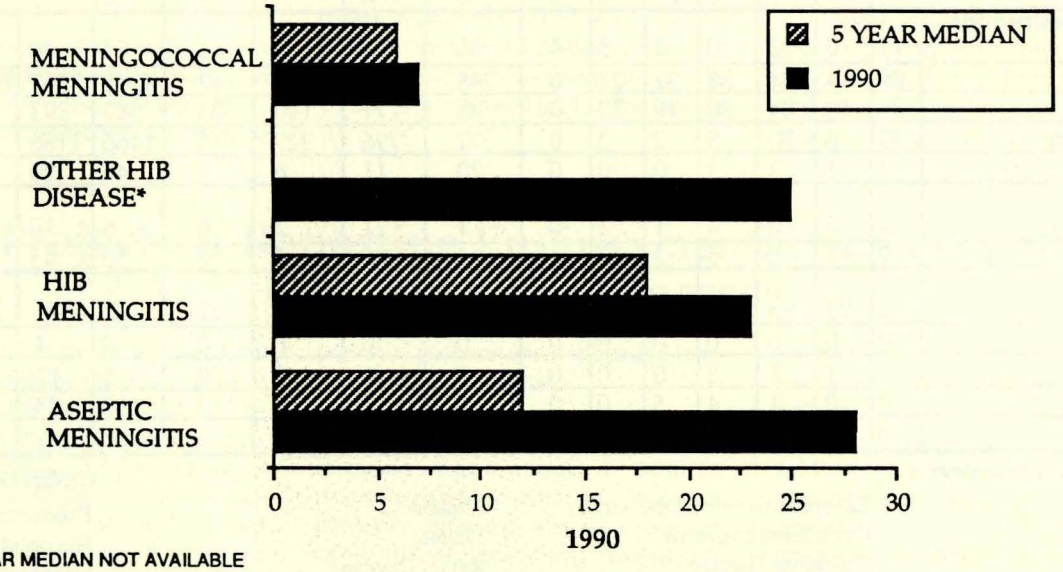
Tear off for future reference.

DISEASE REPORTS, MAY/JUNE 1990 VS. 5 YEAR MEDIAN



MEDIAN = 1985-1989

DISEASE REPORTS, MAY/JUNE 1990 VS. 5 YEAR MEDIAN



*5 YEAR MEDIAN NOT AVAILABLE
MEDIAN = 1985-1989

Measles Cases Increase 423 Percent In Past Year; 41 Deaths Reported

Excerpted from June 1, 1990 issue of the Morbidity and Mortality Weekly Report

Cases of measles in 1989 for the U.S. increased by 423 percent from 1988 figures, according to the June 1, 1990 issue of the Center for Disease Control's *Morbidity and Mortality Weekly Report*, with 41 measles-associated deaths reported that year.

The provisional total of 17,850 measles cases is the largest number reported since 1978. It is the largest number of deaths reported in one year since 1971, when 90 deaths and 75,290 measles cases were reported.

Twenty-three states reported at least 100 cases each to the CDC. Four states - Illinois, Texas, California, and Ohio - accounted for 67.9 percent of the total reported cases.

The highest incidence rate was among children under one year old (51.9 per 100,000). The largest increases in incidence rates were among adults aged 25-29 years (+600 percent) and children under one year old (+592 percent) and 1-4 years old (+562 percent).

A total of 248 outbreaks in 1989, each involving from 5 to 2,440 persons, accounted for 79.4 percent of the cases, according to the report. The largest outbreaks involving predominantly preschool-aged children occurred in Los Angeles, Chicago and Houston, which accounted for 33.9 percent of all cases reported last year.

Complications were reported in 17.3 percent of the cases, including diarrhea, otitis media, pneumonia, and encephalititis, with hospitalization reported in 15.8 percent of persons.

Of reported patients, 40.1 percent were known to have been vaccinated on or after their first birthday. Others with measles were unvaccinated or inadequately vaccinated (i.e., vaccinated before their first birthday).

Measles in 1990

For the first 20 weeks of 1990, there was a 39.6 percent increase over the cases reported for the same period in 1989. Of the patients where detailed information was provided, 42.2 percent were children under five years old, including 13 percent under one year old. Of the 5,178 patients in whom vaccination status was given, 28.6 percent were appropriately vaccinated and 71.3 percent were unvaccinated.

Of the 88 measles outbreaks known to be occurring in 25 states this year, the largest has been in Dallas. The outbreak involves principally unvaccinated preschool-aged children. Outbreaks among preschool children also are continuing in Chicago, Los Angeles and Milwaukee. However, the CDC reports these figures may likely be greatly underestimated, due to lack of complete data from local and state health departments.

From January 1 to May 19, 35 suspected measles-associated deaths have been reported. In 1989, forty-one deaths occurred.

Types of Outbreaks

As in 1988, two types of outbreaks occurred in 1989: those among unvaccinated preschool-aged children and those among highly vaccinated school- and college-aged populations. Why the outbreak in the latter population? When the measles virus is introduced into environments where large numbers of vaccinated people congregate (e.g. schools or colleges), the relatively few susceptible persons may be sufficient to sustain transmission, and outbreaks may occur.

Susceptible persons are considered those who received a single dose of measles vaccine under 15 months of age who may not develop protective immunity. To reduce these numbers, the Immunization Practices Advisory Committee has recommended a second dose of vaccine for groups of persons at high risk for measles, including new entrants to schools and colleges and other institutions for post-high school education. If fully implemented, this strategy should eventually eliminate measles outbreaks in these settings.

In the meantime, aggressive outbreak control in school-based outbreaks with revaccination of persons at risk will continue to be necessary. ■

Influenza, Pneumonia Death Toll Rises Last Winter

Even though the vaccination rate among high-risk individuals was greater than usual, at least 60,000 people died of influenza and pneumonia last winter in the US, according to Federal health official estimates. The death toll is the highest since 1957-58 when 69,800 died.

The high death toll (most were over 65 years old) was attributed largely to the virulence of the Type A-Shanghai flu strain prevalent in the United States. The strain, associated with unusually severe symptoms and a higher death risk, has appeared in previous epidemics. However, this is the first season it has been the dominant strain.

About 40 percent of people in high-risk groups — people over 65, those with chronic illnesses, and infants — received vaccinations, twice as many as ten years ago, according to Walter Gunn, MD, of the CDC's Viral Disease Division. "Otherwise it would have been a much, much worse year."

Reprinted from: The National Foundation for Infectious Diseases, *The Double Helix*, Vol. 15, No. 3, May/June 1990.

A Note About Laboratory Testing for Foodborne Illness

When foodborne illness is suspected, laboratory testing of stool or vomitus can help confirm the diagnosis, assist with decisions regarding treatment, and provide clues to the source of the illness. There are so many different foodborne pathogens, however, that it is not practical to test for all of them in a given case.

Information derived from a thorough history and physical is necessary to narrow the field. The signs and symptoms, foods consumed during the suspected period of exposure, and the incubation period (if known) may provide clues to the most likely causative agents. Appropriate specimens can then be collected and tests ordered accordingly.

Many laboratories routinely test for the most common bacterial pathogens, usually ***Salmonella*** and ***Shigella***. Some include ***Campylobacter*** as well. In many cases, though, other agents such as ***Staphylococcus, Bacillus cereus, Clostridium perfringens, Yersinia enterocolitica, Vibrio*** species, various viruses, or ***Giardia lamblia*** may be implicated.

If multiple cases of foodborne illness are identified and a common source is suspected, the local health authority should be notified immediately by telephone.

DOH has recently developed guidelines for investigation of foodborne outbreaks. Information about specific foodborne pathogens and collection/handling of laboratory specimens is included. Copies are available upon request from the Bureau of Communicable Disease Control, 800/392-0272.

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Adult Immunization Week
October 22 to 26

Lisa Marz, Bureau of Immunization

Routine immunization has become an integral part of pediatric practice, but it has not yet become a standard part of the care physicians provide to adults. Although many vaccine-preventable diseases have been markedly reduced by childhood immunization, they have not been eliminated. A substantial portion of the remaining morbidity and mortality from several of these diseases now occurs in older adolescents and adults. Persons who escaped natural infection or immunization against measles, mumps, rubella, and poliomyelitis as children often are at increased risk for these diseases as adults. Protection against tetanus and diphtheria following childhood vaccination needs to be boosted periodically. Other immunizations are indicated primarily for adults rather than children. Elderly adults and others with certain medical conditions are at increased risk of hospitalization and death caused by pneumonia and influenza, conditions that may be prevented by immunization. Certain occupations, lifestyles, environmental circumstances, or medical conditions associated with compromised immunity place selected groups of adults at risk for other vaccine-preventable diseases. Travelers to areas with endemic diseases not found in developed countries often require special immunizations.

Adults also need to take responsibility for their health and make sure that they are adequately immunized against vaccine-preventable diseases.

Physicians and others who care for adults are encouraged to consider immunizations whenever they see patients for initial evaluations and follow-up visits. Opportunities to do so most commonly arise within the context of primary care, but this does not mean that immunization should be overlooked in other settings. There is a growing recognition that missed opportunities for vaccination occur in hospitals, emergency rooms, and other health care institutions. Such opportunities also may arise outside the health care sector, in schools and colleges, or in the workplace.

The most reliable way to determine a patient's immunization history is to obtain the information from a record kept by the patient or his or her previous physician. Unfortunately, most adults do not have immunization records of their own, and they may have received immunizations from several different providers in the past. Consequently, an accurate history is often difficult to obtain. As a rule, if there is doubt about previous immunizations, it is better to assume that patients are unimmunized.

October 22 to October 26 is National Adult Immunization Week. During this week, the Bureau of Immunization is encouraging local health departments to check the immunization status of the adults they serve and administer the appropriate immunizations to them. Private physicians are encouraged to examine the adult patient's records for deficiencies in immunizations and ensure that their adult patients are protected. Adults also need to take responsibility for their health and make sure that they are adequately immunized against vaccine-preventable diseases. ■

Also Inside this Issue...

Chronic Fatigue Syndrome

(Reprinted in part with permission from the Wisconsin Epidemiology Bulletin)

Chronic fatigue syndrome (CFS) is a recently defined complex of symptoms characterized primarily by chronic or recurrent debilitating fatigue and various combinations of related symptoms such as sore throat, lymph node tenderness, headache, myalgias, arthralgias, sleep disorders, and various neuropsychologic complaints[1]. Clinical signs which may be associated with CFS include a low grade fever, nonexudative pharyngitis, palpable cervical or axillary lymph nodes, and splenomegaly[1,2]. The etiology of CFS is not known and optimal management of the syndrome has not been determined.

Although CFS has received attention during the past several years in both lay and scientific publications, similar symptom complexes have been described in the medical literature for decades. These syndromes have been variously called neurasthenia, benign myalgic encephalomyelitis, atypical poliomyelitis, epidemic neuromyasthenia, Icelandic disease, and fibromyalgia; over the years causality has been attributed to chronic candidiasis, anemia, hypoglycemia, and environmental allergy. Such previously described disorders with unknown etiologies may be similar or identical to CFS.

Prevalence

Because of the lack of pathognomonic clinical or laboratory criteria for CFS, the prevalence and incidence of the syndrome in the general population is not known. Estimates in selected patient groups vary from 24% of 1,159 consecutive patients evaluated in adult primary care clinics[3] to 21% of 500 randomly selected patients in a general medicine practice of a teaching hospital[4] to 4% of 135 patients referred to an internal medicine practice for evaluation of debilitating fatigue[5]. The comparability of data in prevalence studies is limited by different selection criteria for the study cohorts and by the lack of a consistent definition of CFS. The Centers for Disease Control (CDC) has attempted to address these concerns by adopting a working case definition for CFS[1] (see below), and by initiating a pilot program for CFS surveillance and follow-up at four sites in the United States - Atlanta GA, Grand Rapids MI, Reno NV, and Wichita KS.

Etiology

During the mid-1980's, several studies attempted to link CFS to Epstein-Barr virus (EBV) infection, because many patients had antibody profiles suggestive of reactivation of latent EBV infection[6,7]. However, more recent reports have not supported the view that chronic active EBV infection is responsible for CFS[2,4,8]. Elevated levels of antibodies to EBV are frequently found in healthy persons and in persons with a variety of other diseases, and some CFS patients lack antibodies to EBV. Although one study identified some statistically significant associations between positive EBV serologic tests and patients with CFS-like symptoms using age-, sex-, and race-matched controls, the investigators found equally strong or stronger associations between the syndrome and antibody profiles to cytomegalovirus, herpes simplex virus types 1 and 2, and measles virus[2]. The authors also concluded that EBV serologic tests could not reliably differentiate case-patients from non-case patients or control subjects, and found significant inter- and intralaboratory variability in EBV serologic testing. These results are corroborated by the findings of Buchwald et al., who reported no statistically significant differences in antibody profiles to several EBV-specific antigens between fatigue patients and age- and sex-matched controls[4].

Other viruses have been associated with CFS, but causality has not been demonstrated. Antibodies to herpes simplex types 1 and 2, measles virus[2], and cytomegalovirus[2,9] were found to be significantly elevated in some CFS patients. There are also reports of elevated antibody titers to the recently discovered human herpesvirus-6 among CFS patients[8,10]. While such antibody profiles could indicate an association between viral infections and CFS, it is likely that they represent immunologic epiphenomena in which the syndrome permits reactivation of latent viral infections, or causes a nonspecific polyclonal B-lymphocyte activation which augments the titers of antibodies to a variety of agents[2,8]. In a placebo-controlled trial of oral and intravenous acyclovir (an agent with activity against herpes viruses) involving 27 CFS patients, no therapeutic benefit of the drug could be demonstrated[9].

Subtle immunologic abnormalities have been described in CFS. Partial hypogammaglobulinemia has been reported in between 15% and 71% of CFS patients studied[6,7,9]. Other abnormalities reported in CFS patients include an increased ratio of T-lymphocyte helper to suppressor cells[6,7], elevated circulating immune complexes[6,9], and decreased in vitro synthesis of interleukin-2 and gamma interferon by mitogen-stimulated lymphocytes[11]. Furthermore, in a study of 41 CFS patients, defects in natural killer (NK) lymphocytes have been described[12]. Although most of the patients in this group had NK counts within the normal range, the CFS patients in aggregate had lower counts than the control group, and their NK cells were less effective than those of control subjects at killing viral-infected cells. The significance of these immunologic abnormalities is uncertain at this time and it must be noted that the majority of CFS patients do not have detectable immunologic dysfunction.

The significance of psychological factors and psychiatric diseases in CFS is a subject of considerable controversy. Many of the symptoms of CFS are also characteristic of primary mood disorders, and several reports have cited the high proportion of CFS patients with depression and somatic anxiety[3,5,8]. However, such associations do not prove a psychologic cause of fatigue. It is possible that both the fatigue and the psychiatric dysfunction could be concomitant features of the same physiologic illness. Clearly, some of the clinical manifestations of CFS - pharyngitis, fever, lymphadenopathy, splenomegaly - are somatic in nature, and the reports of psychiatric disorders in CFS patients have not always addressed the question of whether these patients are fatigued due to a primary mood disorder, or whether mood disorder developed secondarily to a chronic organic illness[13]. Even if the psychiatric disorder predates the onset of fatigue, it has been postulated that psychopathology may result in subtle biochemical responses or immunomodulation which can perpetuate or predispose to the somatic features of CFS[8,13].

Case Definition

The following case definition[1] was formulated by a working group of epidemiologists, clinicians, and academic research investigators convened by the CDC to provide a basis for future epidemiologic and clinical studies. The definition is intentionally restrictive, seeking to identify persons whose illnesses are most compatible with a possibly unique clinical entity. A case of CFS must fulfill both major criteria and the following minor criteria: at least 6 of the 11 symptom criteria and at least 2 of the 3 physical criteria; or 8 or more of the 11 symptom criteria.

Major Criteria

1. New onset of persistent or relapsing, debilitating fatigability in a person who has no previous history of similar symptoms, that does not resolve with bed rest, and that is severe enough to reduce or impair average daily activity below 50% of the patient's premorbid activity level for a period of at least 6 months.
2. Other clinical conditions that may produce similar symptoms must be excluded by thorough evaluation, based on history, physical examination, and appropriate laboratory findings.*

Minor Criteria (Symptom Criteria)

To fulfill a symptom criterion, a symptom must have begun at or after the time of onset of increased fatigability, and must have persisted or recurred over a period of at least 6 months (individual symptoms may or may not have occurred simultaneously). Symptoms include:

1. Mild fever - oral temperature between 37.5^{0}C and 38.6^{0}C, if measured by the patient - or chills. (Note: oral temperatures > 38.6^{0}C are less compatible with CFS and should prompt studies for other illness.)
2. Sore throat.
3. Painful lymph nodes in the anterior or posterior cervical or axillary distribution.
4. Unexplained generalized muscle weakness.
5. Muscle discomfort or myalgia.
6. Prolonged (≥ 24 hours) generalized fatigue after levels of exercise that would have been easily tolerated in the patient's premorbid state.
7. Generalized headaches (of a type, severity, or pattern that is different from headaches the patient may have had in the premorbid state).
8. Migratory arthralgia without joint swelling or redness.
9. Neuropsychologic complaints (one or more of the following: photophobia, transient visual scotomata, forgetfulness, excessive irritability, confusion, difficulty thinking, inability to concentrate, depression).
10. Sleep disturbance (hypersomnia or insomnia).
11. Description of the main symptom complex as initially developing over a few hours to a few days (this is not a true symptom, but may be considered as equivalent to the above symptoms in meeting the requirements of the case definition).

Minor Criteria (Physical Criteria)

Physical criteria must be documented by a physician on at least two occasions, at least 1 month apart.

1. Low-grade fever - oral temperature between 37.6^{0}C and 38.6^{0}C, or rectal temperature between 37.8^{0}C and 38.8^{0}C. (See note under Symptom Criterion 1.)
2. Nonexudative pharyngitis.
3. Palpable or tender anterior or posterior cervical or axillary lymph nodes. (Note: Lymph nodes > 2 cm in diameter suggest other causes. Further evaluation is warranted.)

Treatment

There is currently no effective treatment for CFS. Management should be directed at relief of symptoms and minimizing the disrupting effect the illness can have on the patient's life. Such assistance can take the form of a regimen of balanced diet, adequate rest, moderate physical conditioning, reintegration into a normal lifestyle consistent with the severity of illness, counseling, and identifying activity limits to avoid exacerbation of fatigue. Periodic re-evaluations of CFS patients should be encouraged in order to insure that symptoms are not the result of some other specific illness which becomes manifest with time.

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Editors Note: In September 1990, preliminary findings were presented which identified HTLV-II, a human retrovirus, as a possible cause for chronic fatigue syndrome. Though DNA sequences similar to some in HTLV-II were found in CFS patients, the implications of this finding are as yet unclear. (Science, Vol. 249, 9-14-90).

*Among the other physical conditions to be excluded are malignancy; autoimmune disease; localized infection; chronic or subacute bacterial disease, fungal disease, and parasitic disease; disease related to HIV infection; chronic psychiatric disease, either newly diagnosed or by history; chronic inflammatory disease; neuromuscular disease; endocrine disease; drug dependency or abuse; side effects of a chronic medication or other toxic agent; or other known or defined chronic pulmonary, cardiac, gastrointestinal, hepatic, renal, or hematologic disease. Although specific laboratory tests or clinical measurements are not required to satisfy the case definition, recommended evaluations include serial weight measurements (weight change of > 10% in the absence of dieting suggests other diagnoses); serial morning and afternoon temperature measurements; complete blood count and differential; serum electrolytes; glucose; creatinine; blood urea nitrogen; calcium; phosphorous; total bilirubin; alkaline phosphatase; serum aspartate aminotransferase; serum alanine aminotransferase; creatine phosphokinase or aldolase; urinalysis; posteroanterior and lateral chest roentgenograms; detailed personal and family psychiatric history; erythrocyte sedimentation rate; antinuclear antibody; thyroid-stimulating hormone level; HIV antibody measurement; and intermediate-strength purified protein derivative (PPD) skin test with controls. If any of these tests are abnormal, the physician should search for other conditions that may cause such a result. If no such conditions are detected by reasonable evaluation, this criterion is satisfied. ■

New Tuberculosis Skin Test Guidelines

H. Denny Donnell Jr., M.D., M.P.H. , Section of Disease Prevention
Vic Tomlinson, Bureau of Tuberculosis Control

The Missouri Department of Health is issuing new guidelines for interpreting results of tuberculin skin tests. These guidelines are consistent with those recently issued by the Centers for Disease Control (CDC) and the American Thoracic Society (ATS). The new guidelines contain three cutting points for determining if a test is positive. The three points are based on individual patient risk factors for tuberculosis.

Based on intracutaneous injection by the Mantoux method of 5 TU, of PPD, the new guidelines are summarized as follows:

A reaction of ***5 or more millimeters*** of induration is classified as positive for the following:

1. Close contacts of persons with infectious tuberculosis
2. Immunosuppressed persons including those with HIV infection and persons on immunosuppressive therapy
3. Persons with abnormal chest x-ray findings that show fibrotic lesions likely to represent old healed tuberculosis

A reaction of ***10 or more millimeters*** of induration is classified as positive for the following:

1. Foreign-born persons from countries with a high prevalence of tuberculosis (i.e., Southeast Asia, Africa, Eastern Europe, Central America, South America, the Caribbean and Pacific Islands)
2. Intravenous drug users and alcoholics
3. Residents and employees of correctional facilities, nursing homes and mental institutions
4. Persons over age 70
5. Homeless individuals
6. Persons with diabetes mellitus, post-gastrectomy, silicosis, prolonged corticosteroid therapy and 10% or more below ideal body weight
7. Persons who provide health care services to high risk groups

A reaction of ***15 or more millimeters*** of induration is classified as positive for persons who do not have any of the above mentioned risk factors.

A **recent conversion** is now defined as at least a 10 millimeter increase within a two-year period for those under age 35 and at least a 15 millimeter increase for those age 35 or older. The previous recommendation had used at least a 6 millimeter increase in induration as the basis for defining a recent conversion.

Multiple-puncture tests should only be used for screening large, low-risk populations. If this test is positive, then it must be confirmed by the Mantoux method. The latter method is still the preferred test for diagnostic evaluation.

In selecting the new criteria for a positive test, various factors were considered including those which influence the sensitivity and specificity of the test, the estimated prevalence of tuberculosis infection in the population and the consequences of misclassification of persons as infected or not infected.

These new guidelines are now officially in use in Missouri. If you have any questions concerning their interpretation, contact the Bureau of Tuberculosis Control at (314) 751-6122. ■

Tuberculosis Treatment: An Update Concerning PZA

The Centers for Disease Control (CDC) and the American Thoracic Society (ATS) now recommends the use of pyrazinamide (PZA) as part of a three drug treatment regimen for the treatment of tuberculosis disease. PZA is bactericidal and is considered highly effective for the first two months when given along with isoniazid and rifampin. After the first two months PZA should be discontinued, but isoniazid and rifampin should be continued for the next four months. The advantages of this three drug combination are a total treatment regimen of only six months as well as the most effective regimen for the treatment of tuberculosis. Continuing PZA beyond the initial two months does not seem to improve the effectiveness of the treatment[1].

A tuberculosis patient who is HIV positive should be treated under the new guidelines for a total of nine months and for at least six months after the culture becomes negative[2]. Again, PZA should be given for the first two months of the regimen and the other two drugs continued for the balance of the treatment period[3].

The recommended daily dosage for PZA is 15 to 30 mg/kg in adults and children up to a maximum of two grams daily[4]. The most important adverse reaction to PZA affects the liver. However, there does not appear to be a significant increase in hepatotoxicity when PZA is given in a dose of 15 to 30 mg/kg for only two months[5].

The cost of treating with isoniazid and rifampin is $240 for nine months and $320 for 12 months. However, the preferred regimen using PZA costs $254. By using the regimen containing two months of PZA, the course of treatment will be shortened and savings will be realized in the reduced number of visits to health care practitioners.

The Missouri Department of Health endorses this highly recommended treatment regimen. If you have any questions concerning it, do not hesitate to call the Bureau of Tuberculosis Control at (314) 751-6122.

References

1. ATS/CDC. Treatment of tuberculosis and tuberculosis infection in adults and children 1986. Am Rev Resp Dis 1986; 134:355-363.
2. TB Fact Sheet. Department of Health and Human Services, PHS, CDC, CPS, DTBC, 1990; 3.
3-5. ATS/CDC. Treatment of tuberculosis and tuberculosis infection in adults and children 1986. Am Rev Resp Dis 1986; 134:355-363. ■

Lead Exposure

Richard Gnaedinger, Ph.D., Bureau of Environmental Epidemiology

Because of industrialization, lead is ubiquitious in the human environment. Its physical and chemical properties have made it exceptionally suitable for a wide variety of applications in industry. It is used in paint and in pottery glazes, in piping and in other materials where pliability and corrosion resistance are required; it is used as shielding against radiation and in additives for gasoline, just to mention a few. Lead's toxicity to living organisms has made it useful as an insecticide, but on the other hand this very property has had an unfavorable impact on human health. The toxic effects on humans have been known for a long time, and recent studies are indicating that lead is even more toxic than once thought.

Because of its ubiquitiousness and deliterious effects on human health, lead has become one of the major contaminants in the environment. Although the toxic properties of lead affect all age groups, attention is generally focused on the serious consequences of elevated lead exposure on the developing nervous system of children.

Children in all socioeconomic strata are exposed to lead in the environment in one way or another. Airborne emissions of lead from the combustion of leaded additives in gasoline has been a major source of exposure prior to the advent of unleaded fuel. Likewise emissions from smelters and from other industries that process lead in one way or another, are additional sources of exposure especially in areas adjacent to these operations. However, the hazards from these sources have been reduced markedly over the years as new laws governing these emissions have been enacted. But the lead emitted previously is still in the environment.

Lead in paint is another major source of exposure. Even though lead is not used in paint at the present time, more than 50% of the homes in the United States contain leaded paint at levels considered hazardous to young children. Unless that paint has been removed, the lead is still there and can be a potential health hazard under certain circumstances.

In the past, canned foods were a source of lead in the diet of children and adults alike. Fortunately, this source has been greatly reduced over the years as the Federal Food, Drug, and Cosmetic Act spelled out the provisions that canned food manufacturers are required to meet regarding the safety of the foods produced. However, ordinary housewares like dishes, glasses, mugs, cooking utensils, cutlery, and electrical appliances, for example, are not regulated under the provisions of the law. Poisonings from these sources are not widespread, however, and most of the documented cases involving housewares centered around the use of glazed pottery that was improperly manufactured.

Another potential source of lead exposure, and one not ordinarily considered, is through groundwater that has been contaminated from waste disposal sites. According to a report by the Agency for Toxic Substances and Disease Registry, lead was found at 43% of the 951 sites studied, and of all the sites covered in the report, 17% were linked to groundwater contamination.

The most important source of lead exposure to children is through drinking water. For years the Federal Safe Drinking Water Act has regulated the amount of lead in drinking water at 50 parts per billion (ppb) at the point of production, that is, as it leaves the water plant. However the provisions of the law did not address the lead level at the point of use, that is, as it comes out of the kitchen sink tap or the drinking water fountain. It is well known now that water, especially corrosive water, can pick up lead as it flows through the distribution system such as the piping in our homes and in the schools. It is generally accepted that most of the lead in the distribution system comes from tin-lead solder that was used on pipe joints and other connections. Recent amendments to the Safe Drinking Water Act have restricted the use of lead in solder, but like leaded paint, leaded solder is still found in most homes and schools.

The Lead Contamination Control Act of 1988 was enacted by Congress to address the problem of lead in the drinking water at the point of use; specifically in the schools and day care centers. A major provision of this act sets a level of 20 ppb lead as an upper recommended level. Another provision requires the State to assist the schools and day care centers in complying with the 20 ppb limit, and a cooperative effort is now underway throughout the state of Missouri to achieve compliance with this limit.

These are some of the more important ways that children are exposed to lead in our environment. For their sake every precaution should be taken to reduce exposure. In cases where high exposure is suspected, blood tests are available which will indicate whether or not excessive absorption of lead has occurred. For further information on the subject of lead exposure, contact the Bureau of Environmental Epidemiology at 314/751-6102. ■

LEAD FACTS

Two-thirds of black children from low-income, urban families have blood lead levels above 15 µg/dl.

More than half of U.S. homes contain leaded paint at levels considered hazardous to young children.

The cost of removing leaded paint from the more than 300,000 public housing units requiring lead abatement is estimated to be almost $400 million.

The EPA estimates that a single course of chelation therapy costs almost $3,000. Chelation therapy is needed for about 5 percent of children with blood lead levels above 25 µg/dl.

source: *Macroview*, May/June 1990

Laboratories Seek New Technology to Screen for Lead Poisoning

(Reprinted with permission from the Public Health Foundation's MACROVIEW, Volume 3, Number 3.)

The expected lowering of the Centers for Disease Control's definition of elevated blood lead levels will challenge state public health laboratories to find new ways to screen children for exposure to lead. Blood lead is a measure of the amount of lead absorbed by the body.

According to Dr. Sue Binder, Chief of CDC's Lead Poisoning Prevention Branch, a special advisory committee is expected to recommend that the definition of an elevated blood lead level be lowered from 25 micrograms per deciliter to 10 or 15 micrograms per deciliter.

The advisory committee will consider the lower definition because of recent studies, such as one conducted by the Harvard Medical School, that show that blood lead levels of about 10 to 15 µg/dl and above in infants and young children are associated with lower average scores on tests of intelligence compared to the test scores of children with lower blood lead levels.

Another study, published in the New England Journal of Medicine, found that children with high dentin (tooth) lead levels, which reflect long-term exposure to lead, were much more likely than other children to drop out of high school, even though they had no apparent symptoms of lead poisoning. Many state public health laboratories, which handle most of the nation's lead screening samples, currently use the erythrocyte protoporphyrin (EP) test to screen for lead toxicity. The EP test is widely used because it is inexpensive, eliminates problems with sample contamination, provides immediate results, and also detects iron deficiency.

Despite its advantages, the EP test is not sensitive enough to screen for lead at levels lower than the current definition of 25 µg/dl. The blood lead screening method, which is more sensitive than the EP test, has the capacity to identify low levels of lead but requires expensive equipment and highly trained staff.

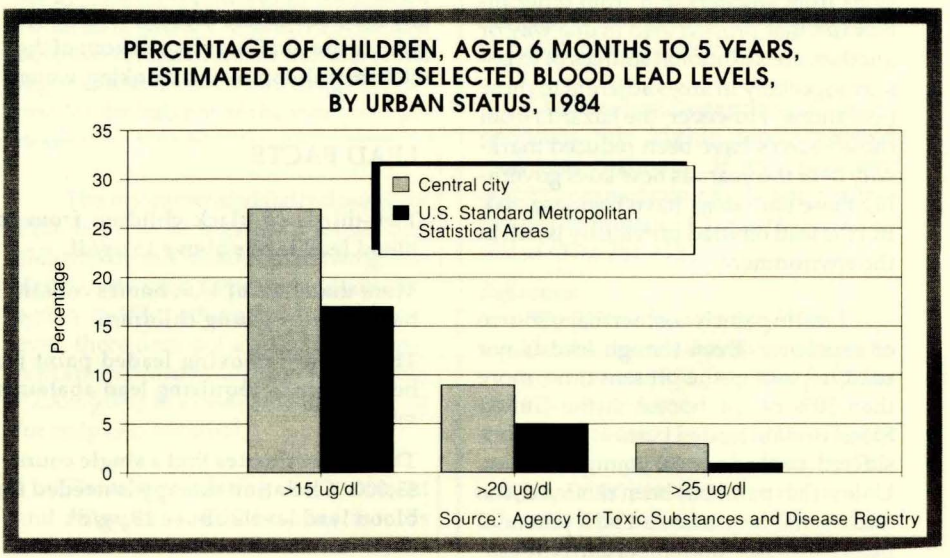
According to Dr. Mahadeo P. Verma, past-President of the Association of State and Territorial Public Health Laboratory Directors, "While the Association supports the move to identify children exposed to low levels of lead, it is important to note that the cost of staffing and equipping state public health laboratories to handle lead screening under the new definition could be as high as $2 million."

Because of the problems associated with testing for low levels of blood lead, CDC is hoping to work with manufacturers of analytic instrumentation either to develop new equipment able to test for low blood lead levels or to refine current methods.

The Agency for Toxic Substances and Disease Registry estimates that over 3 million children under age 6 have blood lead levels above 15 µg/dl, compared to an estimated 250,000 children with elevated blood lead levels according to the current definition.

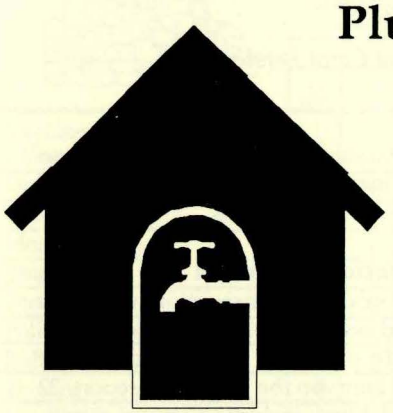
One of the most common sources of lead in the home is lead-based paint. According to a 1988 ATSDR report, over 40 million homes in the U.S. contain leaded paint. Other common sources of lead include soil and dust, gasoline, drinking water, and food.

Children are more susceptible to the effects of lead than adults because their nervous systems are not yet fully developed and the rate at which they absorb lead is significantly higher than it is in adults. Repeated exposures to even very small amounts of lead can result in toxic effects since lead can be in the bones indefinitely. The effects of lead toxicity are frequently lifelong, but are often not readily identifiable until long after exposure. ■



Plumbing Cross-Connections in the Household

Stanley R. Cowan, Bureau of Community Sanitation



Have you ever experienced blue colored water coming out of your faucets?

Believe it or not, this is not an unheard of occurrence for some residents. How did the water turn blue? Before this article answers that question, we need to examine cross-connections.

What is a cross-connection?

Briefly stated, a cross-connection is a linking of potable water lines with nonpotable or undesirable substances.

Contrary to popular belief, water does not always flow in the direction of intended flow in a household plumbing system, and that's where the problem of cross-connections enters.

Water pressure will remain constant in a piping system provided the system remains intact and all faucets remain closed. Whenever a faucet is opened, there will be a slight reduction in pressure. Open several more faucets, pressure will drop more. Generally, the water system will have a pressure switch that will activate a pump to increase the pressure in the system whenever the pressure drops below a certain level. Thus, pressure is not truly constant, but somewhere within a range between when the pump kicks on and off.

Normally, all is well and good. But problems may happen when there are more than just a few faucets opened. For example, freezing weather may cause water lines to break, causing a significant loss of pressure. Or in fighting a fire next door, a fire department pumper truck connected to a fire hydrant can literally suck a water main dry in a matter of minutes.

Besides the inconvenience of low water pressure or no water at all, how does this affect the homeowner?

First, let's consider two everyday illustrations demonstrating pressure differences. Put a drinking straw into a glass of lemonade. When you sip on the straw, you are reducing the air pressure within the straw, creating a partial vacuum. Since air pressure around the straw is greater than within the straw the lemonade will travel up the straw as long as the straw is submerged. A slightly more complex example is siphoning gasoline from a car gas tank into your lawnmower tank. This is accomplished by putting a flexible hose into the car gas tank until the end is submerged in the gasoline. A brief suction on the other end of the hose followed by a quick capping of the hose with your thumb or a squeezing of a pump especially made for this purpose will begin a siphon action. As long as the discharge end of the hose is lower than the fluid level in the car gas tank and the influent end of the hose remains submerged in the fluid, gasoline will flow from one tank to the other.

With these illustrations in mind, let us now transpose a household garden hose in place of the drinking straw, a garden sprayer in place of the car gasoline tank and a break in the city water main in place of applying suction on the gasoline hose. With these conditions in effect, the contents of the garden sprayer, whether it is herbicide, insecticide or other toxic solution, may now be siphoned back through the garden hose, into the household plumbing, and toward the break in the water main. Anyone opening a faucet between the garden sprayer and the water main break may be risking exposure to the toxic material from the sprayer.

Does this sound improbable and a little far-fetched?

This situation occurred at a rural home in northeastern Missouri. The home owner had dropped a garden hose into a container of pesticide to add water to get the proper dilution. A serviceman for the rural water district was repairing a water main and a siphon action was in place. Being thirsty, the home owner went into his home and drew a glass of water. The foam, discoloration and odor warned the home owner not to drink the water. To his credit, he immediately notified the water district and the affected lines were isolated and flushed of the contaminants before anyone else was exposed. The nagging thought occurs, "What if the pesticide did not have a noticeable odor or coloration?"

A slight variation of this arrangement explains the occurrence of the blue water experienced in some households. A recent investigation into one such inquiry led the water utility serviceman to the toilet tank of an upstairs bathroom. It was discovered that a container of a toilet bowl sanitizer containing a blue dye was hanging in the toilet tank reservoir. When the water pressure was reduced and a downstairs faucet was opened, the serviceman got the blue water from the toilet tank reservoir to siphon out of the downstairs faucet. The serviceman even found blue ice cubes in the refrigerator's automatic ice maker.

How can these incidents be prevented?

In both cases, the siphon action can be eliminated by allowing air to enter the plumbing system, which will break the siphoning. To illustrate this, put a hole in the side of the drinking straw we used in the example of the glass of lemonade and then try to drink from it.

For the garden hose, keep the hose from being submerged in any liquid or better yet, install a hose bibb vacuum breaker between the hose bibb and the garden hose. For the toilet tank, replace the ballcock assembly with one that is labeled as anti-siphon type (which has a built-in air gap to prevent submerging of the fill line into the tank reservoir). Both the hose bibb vacuum breaker and the anti-siphon ballcock are readily available from most hardware stores, farm and home suppliers or plumbing outfitters for a modest price. ■

For further information on control of cross-connections, contact your local health department or the Bureau of Community Sanitation, 314/751-6090.

Shigella Outbreak in a Restaurant

Excerpted from a report submitted by Vicky Gibson, Dale Giedinghagen and Carol Persley
Kansas City, Missouri Health Department

Summary

An outbreak of *Shigella sonnei* occurred in May 1989 among patrons of a Kansas City, MO restaurant. The outbreak was investigated by the Kansas City, MO Health Department (KCHD). The Johnson County, KS Health Department conducted interviews and collected fecal specimens of patrons residing in their jurisdiction. There were 50 cases of illness associated with this outbreak.

Background

On May 12, Johnson County, KS Health Department reported that *Shigella* had been isolated from the stool of a patient who developed diarrhea two days after eating lunch on Friday, May 5 at this establishment. By May 15, an additional eight persons who had eaten lunch there on May 5 were identified as being ill. A foodborne outbreak was suspected and an epidemiologic investigation was initiated.

The restaurant involved has seating capacity for 480 patrons. The establishment reports an average volume of 500 patrons on Fridays and 600 on Saturdays. There are approximately 90 employees.

During the months prior to the outbreak the restaurant was cited for violations relating directly to the contamination of food and food contact surfaces and for inadequate handwashing facilities. A Notice of Permit Revocation had been issued to the establishment by the Food Protection Program of the KCHD. However, required corrections were made and the establishment was allowed to obtain a permit.

Epidemiologic Investigation

Management of the restaurant indicated there had been no absenteeism due to illness in the month prior to the investigation. Stool specimens were requested from all kitchen employees. Food from the suspected meals was not available for testing.

The investigation included inspection of the restaurant, collection and analysis of fecal samples, and interviews with ill and well persons exposed to the suspect meal.

An outbreak-related case was defined as a person who 1) had symptoms compatible with Shigellosis, including diarrhea, chills, fever, cramps, headache, nausea, vomiting or gas; 2) had eaten at the restaurant on May 5 or May 6, 1989; and 3) had onset of illness 1 to 7 days after consuming a suspect meal.

Sixty-nine patrons who reported eating at the restaurant were interviewed for food histories, onset and duration of illness, and history of physician consultation and hospitalization. Of the 69 persons interviewed, 50 were considered outbreak-related cases. Diarrhea was the most commonly reported symptom (96%), followed by fever (74%), and cramps (68%). Dates of onset of symptoms ranged from May 6 to May 11. The incubation period ranged from 24-84 hours with an average of 51 hours. The median duration of the illness was 6.4 days.

Stool specimens were obtained from 13 of the cases; 10 were laboratory confirmed as *Shigella* (4 were not specified as to type, and 6 were identified as *Shigella sonnei*). Stool specimens were obtained from 39 employees and tested for *Shigella*. One employee was found to be positive for *Shigella sonnei*, but recalled no illness during the previous month and was asymptomatic at the time of testing. This employee worked part-time and on weekends. She was primarily responsible for all facets of the salad bar preparation and set up.

Consumption of salad bar items and ranch dressing was significantly related to illness. Fifty-one of 58 persons (87.9%) who ate at the salad bar became ill, compared with 3/11 (27.3%) of those who did not report eating at the salad bar ($p=0.0001$, Fisher exact test). All 12 who had ranch dressing became ill, vs 42/57 who did not have ranch dressing ($p=0.039$, Fisher exact test).

Two secondary cases of *Shigella sonnei* were identified in family members of outbreak-related cases.

Sanitation Inspection

A sanitation inspection was conducted on May 18. The restaurant received a score of 57 on a scale of 100. Of the 44 items on the inspection report, 22 were debited, including several significant items relating to food preparation, temperature control, storage, equipment and utensils, and the lack of a handwashing sink in the dishwashing area. By May 19, corrections had been made of items which would have otherwise mandated closure. A private consultant was retained by the restaurant owner to conduct a sanitary educational program for all employees emphasizing handwashing, personal hygiene, proper food holding temperatures, and sanitizing of food preparation areas.

Conclusions

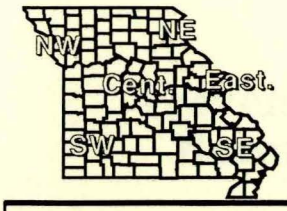
Since no foods from the suspect meals were available for testing, a definite link cannot be established. However, the salad bar and ranch dressing were significantly associated with illness and it is reasonable to suspect as the source the *Shigella sonnei* positive employee who prepared the salad bar. Foods on the salad bar were not held at temperatures cold enough to inhibit the growth of bacteria.

Recommendations

Many recommendations were made to improve the conditions at the restaurant, including: on-going training of employees in food handling and sanitary procedures, installation of handwashing facilities in the dishwashing area and employees' restroom, close monitoring of food storage temperatures, monitoring of the salad bar area for potential contamination by patrons returning with soiled plates, improved dishwashing techniques, and provision of equipment that will maintain cold food at the appropriate temperature. ■

Acknowledgements

Kansas City, MO Health Department; Johnson County, KS Health Department; State Public Health Laboratory.



Missouri Department of Health
Disease Prevention - Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period *
July & August, 1990

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	2 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1990	1989	FOR 1990	FOR 1989	5 YR MEDIAN
Vaccine Preventable Dis.																
Chickenpox	29	17	46	44	27	74	0	0	0	0	0	237	157	9035	6824	6824
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Influenza	0	0	0	0	0	0	0	0	0	0	0	0	0	216	245	72
Measles	0	0	1	13	0	1	0	1	0	0	0	16	62	96	366	31
Mumps	1	0	0	5	0	0	0	0	1	0	0	7	5	51	54	22
Pertussis	9	2	2	1	6	6	0	6	2	2	0	36	75	67	102	24
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	1
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Viral Hepatitis																
A	26	2	1	1	4	0	0	25	1	3	0	63	163	343	500	169
B	10	2	21	3	2	8	0	14	11	14	6	91	131	394	473	289
Non A - Non B	6	1	0	1	2	0	0	6	0	2	1	19	7	43	30	30
Unspecified	2	0	1	0	0	3	0	1	0	0	0	7	2	20	5	14
Meningitis																
Aseptic	7	0	9	6	11	20	0	3	0	9	9	74	89	131	129	72
H. influenza	1	0	2	1	0	1	0	1	1	1	0	8	10	65	62	78
Meningococcal	3	0	1	0	0	0	0	0	0	0	0	4	1	23	12	25
Other	1	0	2	2	1	4	0	3	0	0	0	13	13	51	41	41
Enteric Infections																
Campylobacter	20	0	24	14	6	39	0	5	10	30	17	165	124	377	338	203
Salmonella	25	5	19	16	10	23	0	16	8	12	11	145	166	407	461	460
Shigella	2	8	3	6	6	8	0	15	1	9	2	60	90	155	312	210
Typhoid Fever	0	0	2	0	0	0	0	0	0	1	0	3	1	3	2	2
Parasitic Infections																
Amebiasis	0	0	1	0	1	1	0	0	0	0	0	3	2	11	10	18
Giardiasis	27	8	29	10	15	16	0	13	6	29	12	165	253	447	523	345
Toxoplasmosis	1	0	0	0	0	0	0	0	0	0	0	1	1	2	2	12
Sexually Transmitted Dis.																
AIDS	4	0	3	2	3	0	1	30	16	9	0	68	87	334	245	115
Gonorrhea	134	12	87	107	21	22	0	817	1414	594	22	3230	3884	13323	12755	12520
Genital Herpes	38	9	34	30	26	21	0	101	81	168	7	515	290	2191	1429	1277
Nongonoc. urethritis	18	9	36	20	3	1	0	369	804	320	2	1582	1328	5154	4653	5219
Prim. & Sec. syphilis	2	0	4	1	0	0	0	29	12	3	0	51	28	158	95	80
Tuberculosis																
Extrapulmonary	2	0	2	1	0	0	1	0	1	0	0	7	11	25	31	31
Pulmonary	4	1	1	14	1	2	1	7	3	35	1	70	39	186	137	158
Zoonotic																
Animal Bites	261	80	70	137	94	287	0	0	0	0	0	929	1066	3878	2994	1987
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Rabies (Animal)	0	0	4	0	0	0	0	0	1	0	0	5	16	20	48	41
Rocky Mtn. Sp. Fever	2	0	1	4	7	0	0	0	0	0	1	15	17	27	42	20
Tularemia	1	0	0	5	2	0	0	0	0	0	0	8	14	21	28	28

Low Frequency Diseases

Anthrax
Botulism
Brucellosis
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious) - 4
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 1
Legionellosis - 10
Leptospirosis
Lymphogranuloma Venereum
Malaria -2
Plague
Rabies (human)
Reye's Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome - 1
Trichinosis

Outbreaks

Foodborne/Waterborne - 5
Histoplasmosis
Nosocomial - 4
Pediculosis
Scabies - 3
Other - 1

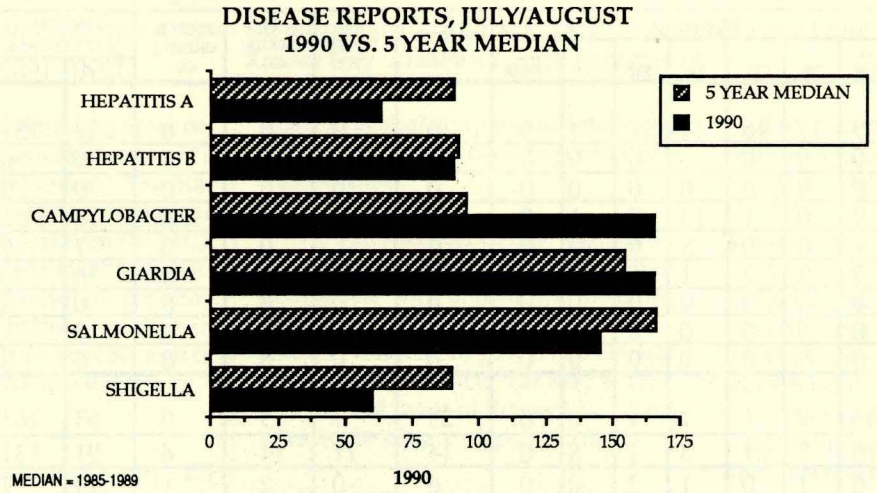
*Reporting Period Beginning July 1, Ending August 31.

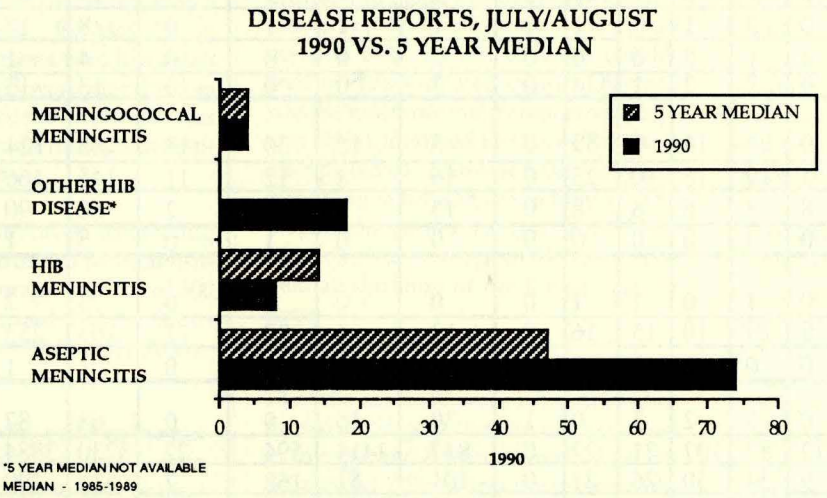
**Totals do not include KC, SLC, SLCo, or Springfield

***State and Federal Institutions

Due to data editing, totals may change.

TEAR OUT FOR FUTURE REFERENCE





Enteric diseases in Missouri for the months of July/August 1990 are lower than their five year medians with the exception of Campylobacter and Giardia. Comparisons of the first six months of 1990 to the congruent time period in 1989 shows the same trend. For the first six months of 1990, Campylobacter showed no significant changes and Giardia showed a 4% increase. Salmonella presented a decrease of 13%. Shigella showed a marked decrease of 133% from 1989 to 1990 for this same time and may indicate a significant change as this is also reflected in the comparisons of the months of July/August 1990 and the five year median.

Also seen in the first six months of 1990, an apparent 20% reduction in the number of cases of Hepatitis A continues the trend seen in 1989. Reversing the trend for Hepatitis B infection, figures show a 13% decrease from 1989.

Comparisons of meningitis reports for the months of July/August 1990 with the five year medians showed no change in Meningococcal meningitis, a decrease in Hib meningitis and a substantial increase in Aseptic meningitis. Other Hib disease is a recent addition to our tabulations and comparisons with other years is not possible at this time.

However, when comparing the first six months of 1990 to the first six months of 1989 we see increasing trends across the board. Meningococcal meningitis is up 73%, aseptic meningitis is up 43% and Hib meningitis is up 10%. Aseptic meningitis has been increasing for the past two years, following a historical cyclic pattern.

Prevention and Control of Influenza, 1990-91 Season Recommendations of the Immunization Practices Advisory Committee (ACIP)

Influenza vaccine is strongly recommended for any person 6 months or more of age who, because of age or underlying medical condition, is at increased risk for complications of influenza[1]. Health care workers, others, including household members in close contact with high-risk persons, should also be vaccinated. In addition, influenza vaccine may be given to any person who wishes to reduce the chance of becoming infected with influenza.

The tri-valent influenza vaccine prepared for the 1990-91 season will include A/Taiwan/1/86 - like (H1N1), A/Shanghai/16/89 - like (H3N2), and B/Yamagata/16/88 - like hemagglutinin antigens. Recommended doses are listed in Table 1 of the ACIP article. Although the current influenza vaccine can contain one or more antigens used in previous years, annual vaccination using the current vaccine is necessary because immunity for an individual declines in the year following vaccination. Because the 1990-91 vaccine differs from the 1989-90 vaccine, supplies of 1989-90 vaccine should not be used to provide protection for the 1990-91 influenza season. Two doses may be required for a satisfactory antibody response in previously unvaccinated children less than 9 years of age. However, studies with vaccines similar to those in current use have shown little or no improvement in antibody responses when a second dose is given to adults during the same season. During the past decade, data on influenza vaccine immunogenicity and side effects have been obtained when vaccine has been administered intra-muscularly. Because there has been no adequate evaluation of recent influenza vaccines administered by other routes, the intra-muscular route is the one recommended for use. Adults and older children should be vaccinated in the deltoid muscle and infants and young children in the anterolateral aspect of the thigh.

Because of high-risk of influenza related complications in some groups, particular efforts should be directed towards vaccinating the following populations: 1) persons 65 years of age or older; 2) nursing home residents or other chronic care medical facility residents; 3) adults and children with chronic cardiovascular or pulmonary disorders, including asthma; 4) adults and children with chronic diseases including diabetes mellitus, other

continued...

Table 1. Influenza vaccine* dosage, by patient age - United States, 1990-1991 season

Age group	Product†	Dosage	No. doses	Route§
6-35 mos.	Split virus only	0.25 mL	1 or 2¶	IM
3-8 yrs.	Split virus only	0.50 mL	1 or 2¶	IM
≥9 yrs.	Whole or split virus	0.50 mL	1	IM

*Contains 15µg each of A/Taiwan/1/86 - like (H1N1), A/Shanghai/16/89 (H3N2), and B/Yamagata/16/88 - like hemagglutinin antigens in each 0.5 mL. Manufacturers include Connaught Laboratories, Inc. (distributed by E.R. Squibb & Sons, Inc.) (Fluzone whole or split); Evans Medical Ltd.-Lederle Laboratories (distributed by Lederle Laboratories) (Flu-Imune purified surface antigen vaccine); Parke-Davis (Fluogen split); and Wyeth-Ayerst Laboratories (Influenza Virus Vaccine, Trivalent split). For further product information call Connaught, (800) 223-0432; Wyeth-Ayerst, (800) 950-5099.

†Because of the lower potential for causing febrile reactions, only split-virus vaccines should be used in children ("split virus" refers to viruses that have been chemically treated to reduce the level of potentially pyrogenic components). They may be labeled as "split," "subvirion," or "purified-surface-antigen" vaccine. Immunogenicity and side effects of split- and whole-virus vaccines are similar in adults when vaccines are used at the recommended dosage.

§The recommended site of vaccination is the deltoid muscle for adults and older children. The preferred site for infants and young children is the anterolateral aspect of the thigh.

¶Two doses are recommended for children <9 years of age who are receiving influenza vaccine for the first time.

1 *Centers for Disease Control, Prevention and Control of Influenza: Recommendations of the Immunization Practices Advisory Committee (ACIP). Morbidity and Mortality Weekly Report, 1990: 39 (rr-7).

metabolic disorders, renal disease or hemoglobinopathies; 5) immune-compromised persons, including persons undergoing immuno-suppressive therapies and persons infected with HIV. Vaccination may produce protective antibodies in many of these people, although antibody response may be inadequate in those more severely infected; and 6) children under 18 years of age receiving long-term aspirin therapy, who could be at risk of developing Reye Syndrome after influenza.

Persons who attend or live with high-risk persons should also receive influenza vaccine, in order to reduce the risk of transmission of disease to those at high-risk. Such persons include: 1) physicians, nurses and other health care providers who have contact with high-risk persons, including infants; 2) employees of nursing homes and chronic care facilities; 3) providers of home care to high-risk persons; and 4) those who live in households of high-risk persons.

"Because the 1990-91 vaccine differs from the 1989-90 vaccine, supplies of 1989-90 vaccine should not be used to provide protection for the 1990-91 influenza season."

Influenza vaccinations are best performed each year in the fall before disease activity becomes widespread. Cases of influenza in Missouri occur most often between the end of December and April. The optimum time in which to immunize high-risk groups is usually the beginning of November, although vaccination can begin in late October. Substantially earlier vaccinations may not provide adequate protection throughout the entire influenza season. ■

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Tuberculosis Screening in a Missouri State Correctional Facility

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During July and October, 1990 a mass tuberculin testing program was initiated at the Missouri State Penitentiary (MSP) in Jefferson City as a result of 14 cases of tuberculosis that had occurred there since 1986 and the fact that 57% (8/14) of the cases were resistant to at least one antituberculosis medication. The Missouri Departments of Corrections and Health worked cooperatively in planning, coordinating, educating and conducting the testing program. The result was an efficient and effective testing initiative.

The results of the testing program revealed a total level of infection of 20.8% (470/2,257) among inmates and 9.2% (66/719) among staff. These statistics include those who were found to be positive for the first time as well as those who were previously positive on the Mantoux skin test. In addition, two active cases of tuberculosis disease were detected during the course of this mass testing effort. Those inmates who had positive skin tests were tested for Human Immunodeficiency Virus (HIV) infection, or AIDS, as a result of the close association between tuberculosis and HIV infection. Individuals who are HIV infected are at very high-risk of developing tuberculosis.

Those inmates with positive skin tests received a chest x-ray and were evaluated by the MSP prison physician for preventive therapy. As a result of the July testing effort, 238 inmates were put on isoniazid preventive therapy. However, some inmates, who were initially negative, were retested during October as close contacts to two cases of tuberculosis and are being evaluated for preventive treatment. The 5 millimeter cutting point was used for close contacts to determine if a test were positive. However, the 10 millimeter cutting point was used for all other reactors in defining a positive test. The staff members with positive skin tests were referred to private physicians for chest x-rays and evaluation for treatment.

Of the 238 inmates who were placed on preventive treatment, only 15.1% (36/238) showed-up for their medication initially. These inmates had been put on twice weekly directly observed therapy with isoniazid. Then the Departments of Corrections and Health initiated an intensive educational program in an effort to improve compliance. The educational approach included developing a video tape that was shown to the inmates. A recent report from the Department of Corrections indicates that 79.8% (190/238) of the inmates now are taking their medication. In an attempt to attain 100% compliance, the Department of Corrections is also considering developing a contractual agreement with the 238 inmates regarding the issue of compliance.

The 20.8% level of infection among inmates at the MSP is high in comparison to correctional facilities in other states including Nassau County, New York (19.7% in 1990), North Carolina

(continued on page 4)

Inside this Issue...

HIV Care Coordination

Missouri, through the Bureau of AIDS Prevention's HIV Care Coordination Program, became the first state in the nation to develop and implement a statewide system of case management for persons with HIV infection. HIV Care Coordination provides assistance in locating, expediting and coordinating medical and psychosocial services at the least restrictive level feasible. Clients may participate in the program from the time they are found to be HIV seropositive (even if asymptomatic) throughout their illness. Services are provided free of charge regardless of the client's income or insurance status.

The goals of HIV Care Coordination are to:

- Decrease the fragmentation of care across many settings by integrating and expediting the delivery of services
- Provide quality care in a timely and consistent manner across a continuum of care
- Enhance the quality of life for Missouri citizens with HIV-related illness
- Contain costs

Staff

HIV Care Coordination is provided by multi-disciplinary teams of community health nurses and clinical social workers. These teams are located in the Northwestern Region (Kansas City), Southwestern Region (Springfield), Central Region (Jefferson City) and Eastern Region (St. Louis). The Bootheel Office, a branch of the Eastern Region, is located in Jackson, Missouri. Staff currently consists of nurses, social workers and clerk typists. The team located in Jefferson City also includes a quality assurance specialist who has responsibility for monitoring and auditing HIV Care Coordination activities statewide.

Client Care

Clients are visited on a regular basis in their homes by HIV Care Coordination staff. The purpose of the home visit is to evaluate/assess the client's needs on an ongoing basis to assure that the plan of care is appropriate. Staff assist clients and their families to locate and access needed services.

AIDS Waiver

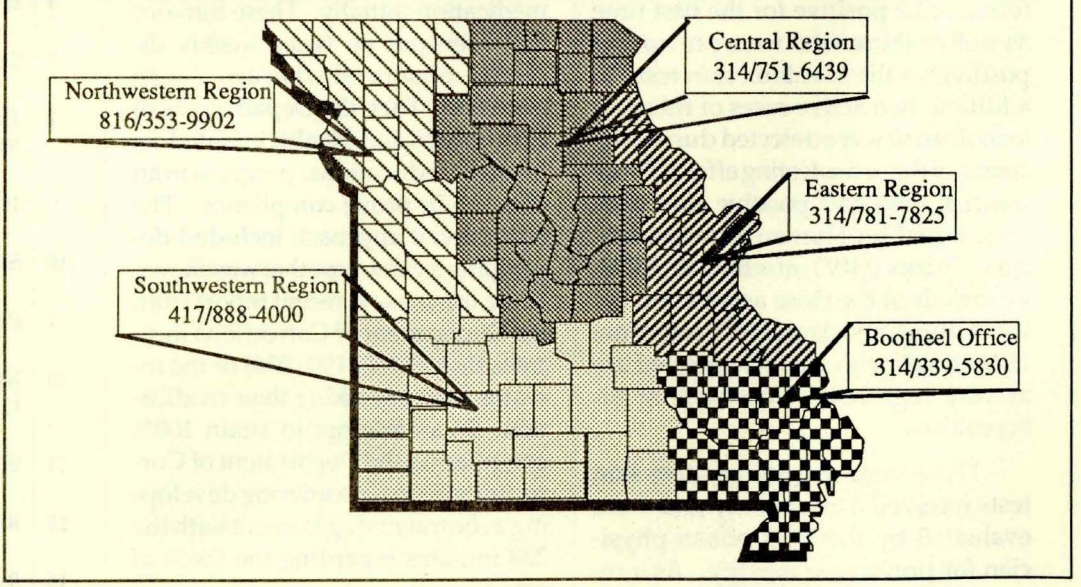
The Medicaid Home and Community-Based Services waiver for persons with AIDS is a part of HIV Care Coordination. The waiver became effective July 1, 1989. The program, which is a joint initiative between the Department of Health and the Department of Social Services, allows medicaid to pay for services which are not currently available under the regular medicaid program in the same amount, duration and scope. The four waiver services include private duty nursing, attendant care, transportation and supplies. The purpose of the program is to allow medicaid recipients to receive services in their home during the final stages of their disease in lieu of hospital care at costs equal to or less than those they might otherwise incur.

In order to receive waiver services, medicaid recipients are assessed by HIV Care Coordination staff to determine if they require the level of care provided in a hospital. This assessment is completed every six months unless changes in the client's condition necessitate more frequent evaluations. Only clients who meet the level of care criteria and are assessed as needing waivered services are enrolled.

When the decision is made to enroll the client, a plan of care is developed by the care coordinator with input from the client, family, loved ones, primary care physician and home care agencies. Care coordinators calculate the cost effectiveness of this plan and then prior authorize the payment of services. To receive payments providers must meet eligibility requirements.

Since the HIV Care Coordination Program was initiated in mid-1989, a cumulative total of 714 clients have been served statewide. Of this number, 377 clients are in the current active case load. ■

HIV Care Coordination Regions



National Childhood Vaccine Injury Act: Requirements for Permanent Vaccination Records

Reprinted from the Morbidity & Mortality Weekly Report, April 8, 1988/Vol. 37/No. 13

Since March 21, 1988, health-care providers who administer certain vaccines and toxoids are required by law to permanently record certain information and to report certain events.* The vaccines and toxoids to which these requirements apply follow: diphtheria and tetanus toxoids and pertussis vaccine (DTP); pertussis vaccine (P); measles, mumps, and rubella single-antigen vaccines and combination vaccines (MMR,MR); diptheria and tetanus toxoids (DT); tetanus and diphtheria toxoids (Td); tetanus toxoid (T); poliovirus vaccine live, oral (OPV); and poliovirus vaccine inactivated (IPV) (Table 1). The requirements also will apply to DTP combined with inactivated poliovirus vaccine (DTP/Polio combined) if it becomes available.

Specifically, all health-care providers who administer one or more of these vaccines or toxoids are required to ensure that there is recorded in the vaccine recipient's permanent medical record (or in a permanent office log or file) the date the vaccine was administered, the manufacturer and lot number of the vaccine, and the name, address, and title of the person administering the vaccine. The term health-care provider is defined as any licensed health-care professional, organization, or institution, whether private or public (including federal, state, and local departments and agencies), under whose authority a specified vaccine is administered.

* The National Childhood Vaccine Injury Act of 1986, at Section 2125 of the Public Health Service Act as codified at 42 U.S.C. 300aa-25 (Supp.1987). ■

HBsAg Prenatal Screening Program

The United States currently contains an estimated pool of 750,000-1,000,000 Hepatitis B Virus (HBV) carriers. Approximately 25% of HBV carriers develop chronic active hepatitis, which often progresses to cirrhosis. Moreover, HBV carriers have a risk of developing primary liver cancer that is 12-300 times higher than that of other persons. It is estimated that 4,000 persons die each year from HBV-related cirrhosis, and more than 800 die from HBV-related liver cancer.

Serious chronic disease and a uniformly fatal type of cancer acquired through HBV can be prevented with HBV vaccine if given before or shortly after a person has been placed at risk of infection. In 1988 the Immunization Practices Advisory Committee (ACIP) recognized the severity of long-term sequelae in infants, who acquired HBV through perinatal transmission, and recommended universal hepatitis B surface antigen (HBsAG) screening of prenatal patients as a strategy to prevent perinatal HBV transmission.

The Missouri Bureau of Immunization has been awarded federal funds to assist public providers in implementing a statewide HBsAg Prenatal Screening Program. The funds for Missouri HBsAg Prenatal Screening Program will be used for the following activities:

1. to serologically screen public prenatal patients for HBsAg;
2. to serologically screen the household contacts of HBsAg-positive public prenatal patients for HBV; and
3. to provide Hepatitis B Immune Globulin (HBIG) and/or HBV vaccine to newborn infants and to susceptible household contacts of HBsAg-positive public prenatal patients.

Public health care providers who provide prenatal care are encouraged to contact the Bureau of Immunization at 314-751-6133 for further information. ■

CDC Study of Illnesses Associated with *Campylobacter fetus subspecies fetus*

The Centers for Disease Control will be conducting a case-control study during the next 12 months to determine risk factors for acquiring opportunistic *Campylobacter fetus* infections. The interviews will be conducted by phone from CDC.

Cases will be obtained from the National Surveillance System and the *Campylobacter* Reference Laboratory at CDC. Local health departments will be asked for help in contacting each case's primary care physician.

If the isolate has been retained, they will ask that it be referred to the *Campylobacter* Reference Laboratory. Each physician will be asked for permission to contact the patient and to suggest the names of two controls from his practice.

Cases and controls will be contacted by phone and asked to complete the study questionnaires. Information will be provided regarding the progress of the study and the analysis of the collected data. Your cooperation will be appreciated. ■

(18% in 1987), New Mexico (11.6% in 1986-87) and Washington (12.5% in 1983). In addition, the level of infection at the Renz facility in Missouri was 14.2% in 1988. The rate of tuberculosis disease at the MSP, through October, 1990, is 177.2 per 100,000 population. This rate is higher than that of the New York State system in 1986 (105.5), the New Jersey system in 1987 (109.9) and the California system in 1987 (80.3). [1]

The Missouri Department of Health has subsequently recommended that annual testing of inmates be implemented throughout the state correctional system. The annual testing of this high-risk group would provide a comprehensive and timely approach to the detection of infection and disease. In addition to testing the inmates, annual testing of the staff is also recommended. The latest guidance material from the Centers for Disease Control, (adopted by the Department of Health) recommends the annual testing of staff in correctional facilities.[2] The tuberculosis problem in correctional facilities is likely to worsen during the next decade in part due to the HIV infection association with tuberculosis.

If you have any questions concerning this information, please contact the Bureau of Tuberculosis Control at (314) 751-6122.

References

[1]Centers for Disease Control. Prevention and Control of Tuberculosis in Correctional Facilities. MMWR 1989;38/18:313.

[2]Centers for Disease Control. Prevention and Control of Tuberculosis in Correctional Facilities. MMWR 1989;38/18:315. ■

HIV/AIDS Statistics

November 1990

Missouri Department of Health
Bureau of AIDS Prevention

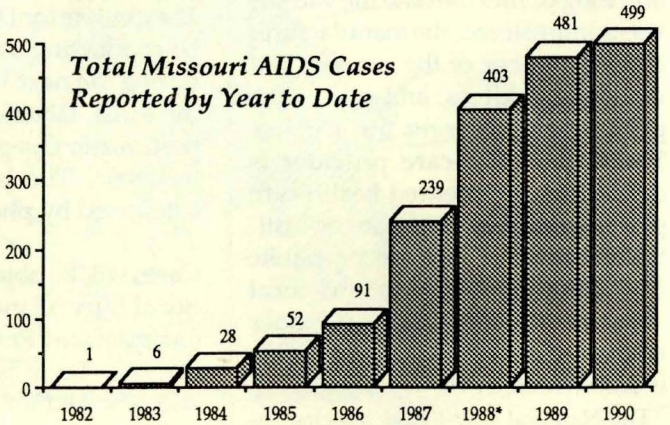
Total AIDS Cases to Date

U.S. AIDS case reports	154,917	
U.S. AIDS deaths reported	95,774	61.8%
Missouri AIDS case reports	1,800	
Missouri AIDS deaths reported	982	54.6%
Cases reported in Missouri with official residence elsewhere	277	

Total Diagnostic Tests Performed by State Laboratory

	# of Tests	# Positive	Percent Positive
1986	2,620	306	11.6%
1987	14,508	441	3.0%
1988	39,203	698	1.8%
1989	57,458	872	1.5%
1990 (to date)	61,594	966	1.6%

Cases Reported in Missouri, 1982-1990



*One 1988 case diagnosed in 1969

Spacing of Immunobiologics

Reprinted from the *Morbidity and Mortality Weekly Report*
April 7, 1989/Vol. 38/No. 13

Multiple Doses of Same Antigen

Some products require administration of more than one dose for development of an adequate antibody response. In addition, some products require periodic reinforcement (booster) doses to maintain protection. In recommending the ages and/or intervals for multiple doses, the ACIP takes into account risks from disease and the need to induce or maintain satisfactory protection.

Intervals between doses that are longer than those recommended do not lead to a reduction in final antibody levels. Therefore, it is not necessary to restart an interrupted series of an immunobiologic or to add extra doses.

In contrast, giving doses of a vaccine or toxoid at less than recommended intervals may lessen the antibody response and therefore should be avoided. Doses given at less than recommended intervals should not be counted as part of a primary series.

Some vaccines produce local or systemic symptoms in certain recipients when given too frequently (e.g., Td, DT, and rabies). Such reactions are thought to result from the formation of antigen-antibody complexes. Good recordkeeping, careful patient histories, and adherence to recommended schedules can decrease the incidence of such reactions without sacrificing immunity.

Different Antigens

Experimental evidence and extensive clinical experience have strengthened the scientific basis for giving certain vaccines at the same time. Many of the widely used vaccines can safely and effectively be given simultaneously (i.e., on the same day, not at the same site). This knowledge is particularly helpful when there is imminent exposure to several infectious diseases, preparation for foreign travel, or uncertainty that the person will return for further doses of vaccine.

1. Simultaneous administration - In general, inactivated vaccines can be administered simultaneously at separate sites. However, when vaccines commonly associated with local or systemic side effects (e.g., cholera, typhoid, and plague) are given simultaneously, the side effects can be accentuated. Whenever possible, these vaccines should be given on separate occasions.

Simultaneous administration of pneumococcal polysaccharide vaccine and whole-virus influenza vaccine elicits satisfactory antibody responses without increasing the incidence or severity of adverse reactions. Simultaneous administration of the pneumococcal vaccine and split-virus influenza vaccine can also be expected to yield satisfactory results. Influenza vaccine should be administered annually to the target population.

In general, simultaneous administration of the most widely used live and inactivated vaccines has not resulted in impaired antibody responses or increased rates of adverse reactions. Administration of combined measles, mumps, and rubella (MMR) vaccine yields results similar to administration of individual measles, mumps, rubella vaccines at different sites. Therefore, there is no medical basis for giving these vaccines separately for routine immunization instead of the preferred MMR combined vaccine.

There are equivalent antibody responses and no clinically significant increases in the frequency of adverse events when DTP, MMR, and oral polio vaccine (OPV) or inactivated polio vaccine (IPV) are administered either simultaneously at different sites or separately. As a result, routine simultaneous administration of MMR, DTP, and OPV (or IPV) to all children >15 months who are eligible to receive these vaccines is recommended. Administration of MMR at 15 months followed by DTP and OPV (or IPV) at 18 months remains an acceptable alternative, especially for children with caregivers known to be generally compliant with other health-care recommendations. Data are lacking on concomitant administration of Haemophilus influenzae b conjugate vaccine (HbCV) or Haemophilus influenzae b polysaccharide vaccine (HbPV) and MMR and OPV vaccine. If the child might not be brought back for future immunizations, the simultaneous administration of all vaccines (including DTP, OPV, MMR, and HbCV or HbPV) appropriate to the age and previous vaccination status of the recipient is recommended. Hepatitis B vaccine given with DTP and OPV or given with yellow fever vaccine is as safe and efficacious as these vaccines administered separately.

The antibody responses of both cholera and yellow fever vaccines are decreased if given simultaneously or within a short time of each other. If possible, cholera and yellow fever vaccinations should be separated by at least 3 weeks. If there are time constraints and both vaccines are necessary, the injections can be given simultaneously or within a 3-week period with the understanding that antibody response may not be optimal. Decisions on the need for yellow fever and cholera immunizations should take into account the amount of protection afforded by the vaccine, the possibility that environmental or hygienic practices may be sufficient to avoid disease exposure, and the existence of vaccination requirements for entry into a country.

2. Nonsimultaneous administration - Inactivated vaccines do not interfere with the immune response to other inactivated vaccines or to live vaccines except, as noted above, with cholera and yellow fever vaccines. In general, an inactivated vaccine can be given either simultaneously or at any time before or after a different inactivated vaccine or a live vaccine.

There are theoretical concerns that the immune response to one live-virus vaccine might be impaired if given within 30 days of another. Whenever possible, live-virus vaccines not administered on the same day should be given at least 30 days apart (Table 1).

Live-virus vaccines can interfere with the response to a tuberculin test. Tuberculin testing can be done either on the same day that live-virus vaccines are administered or 4-6 weeks afterwards.

Immune Globulin

If administration of an IG preparation becomes necessary because of imminent exposure to disease, live-virus vaccines can be given simultaneously with the IG product, with the recognition that vaccine-induced immunity might be compromised. The vaccine should be administered at a site remote from that chosen for the IG inoculation. Vaccination should be repeated about 3 months later unless serologic testing indicates that specific antibodies have been produced. OPV and yellow fever vaccines are exceptions, however, and are not affected by administration of IG at any time.

Live, attenuated vaccine viruses might not replicate successfully, and antibody response could be diminished when the vaccine is given after IG or specific IG preparations. Whole blood or other antibody-containing blood products can interfere with the anti-

cont'd...

body response to measles, mumps, and rubella vaccines. In general, these parenterally administered live vaccines should not be given for at least 6 weeks, and preferably 3 months, after IG administration. However, the postpartum vaccination of susceptible women with rubella vaccine should not be delayed because of receipt of anti-Rho(D) IG (human) or any other blood product during the last trimester of pregnancy or at delivery. These women should be vaccinated immediately after delivery and, if possible, tested in 3 months to ensure that rubella immunity was established.

If administration of IG preparations becomes necessary after a live-virus vaccine has been given, interference can occur. Usually, vaccine virus replication and stimulation of immunity will occur 1-2 weeks after vaccination. Thus, if the interval between administration of live-virus vaccine and subsequent administration of an IG preparation is < 14 days, vaccination should be repeated at least 3 months after the IG product was given, unless serologic testing indicates that antibodies were produced.

In general, there is little interaction between IG preparations and inactivated vaccines. Therefore, inactivated vaccines can be given simultaneously or at any time before or after an IG product is used. For example, postexposure prophylaxis with simultaneously administered hepatitis B, rabies, or tetanus IG and the corresponding inactivated vaccine or toxoid does not impair the immune response and provides immediate protection and long-lasting immunity. The vaccine and IG should be given at different sites, and standard doses of the corresponding vaccine should be used. Increasing the vaccine dose volume or number of immunizations is not indicated (Table 2). ■

TABLE 1. Guidelines for spacing live and killed antigen administration

Antigen combination	Recommended minimum interval between doses
>2 Killed antigens	None. May be given simultaneously or at any interval between doses.*
Killed and live antigens	None. May be given simultaneously or at any interval between doses.†
>2 Live antigens	4-wk minimum interval if not administered simultaneously.

*If possible, vaccines associated with local or systemic side effects (e.g., cholera, typhoid, plague vaccines) should be given on separate occasions to avoid accentuated reactions.

†Cholera vaccine with yellow fever vaccine is the exception. If time permits, these antigens should not be administered simultaneously, and at least 3 weeks should elapse between administration of yellow fever vaccine and cholera vaccine. If the vaccines must be given simultaneously or within 3 weeks of each other, the antibody response may not be optimal.

TABLE 2. Guidelines for spacing the administration of immune globulin (IG) preparations and vaccines

Simultaneous administration:		
Immunobiologic combination		**Recommended minimum interval between doses**
IG and killed antigen		None. May be given simultaneously at different sites or at any time between doses.
IG and live antigen		Should generally not be given simultaneously.* Ifunavoidable to do so, give at different sites and revaccinate or test for seroconversion in 3 mos.
Nonsimultaneous administration:		
Immunobiologic administered		
First	**Second**	**Recommended minimum interval between doses**
IG	Killed antigen	None
Killed antigen	IG	None
IG	Live antigen	6 wks and preferably 3 mos*
Live antigen	IG	2 wks

*The live-virus vaccines, oral polio and yellow fever, are exceptions to these recommendations. Either vaccine may be administered simultaneously or at any time before or after IG without significantly decreasing the antibody response (3).

Tetanus Prophylaxis in Wound Management

History of Tetanus Immunization (Doses)	CLEAN, MINOR WOUNDS		ALL OTHER WOUNDS [1]	
	Td [2]	TIG [3]	Td [2]	TIG [3]
Uncertain or less than three	Yes	No	Yes	Yes
Three or more	No [4]	No	No [5]	No

1) Such as, but not limited to, wounds contaminated with dirt, feces, soil, and saliva, puncture wounds, avulsions, and wounds resulting from missiles, crushing, burns, and frostbite.

2) Use of Tetanus toxoid (T) without the diphtheria component is no longer recommended. DTP (or DT if pertussis vaccine is contraindicated) is recommended for children under seven years of age.

3) TIG-Tetanus Immune Globulin. The recommended dose for wounds of average severity is 250 units intramuscularly. When both Td and TIG are administered, use a separate syringe and separate injection sites.

4) Yes, if more than 10 years since last dose.

5) Yes, if more than five years since last dose. (More frequent boosters are not needed and can accentuate side effects.)

REMINDER: Enter any immunization administered on patient's personal immunization record, or give patient a notification of immunization for his/her record.

This poster was developed by the Bureau of Immunization, Missouri Department of Health and adapted from a guide published July 1985 by the USPHS Immunization Practices Advisory Committee.

Tetanus Prophylaxis in Wound Management

MMWR, July 12, 1985, Recommendations of the Immunization Practices Advisory Committee (ACIP)

Chemoprophylaxis against tetanus is neither practical nor useful in managing wounds; wound cleaning, debridement when indicated, and proper immunization are important. The need for tetanus toxoid (active immunization), with or without tetanus immune globulin (TIG) (passive immunization), depends on both the condition of the wound and the patient's immunization history (see poster on page 7: Tetanus Prophylaxis in Wound Management). Rarely has tetanus occurred among persons with a documented primary series of toxoid injections.

A thorough attempt must be made to determine whether a patient has completed primary immunization. Patients with unknown or uncertain previous immunization histories should be considered to have had no previous tetanus toxoid doses. Persons who had military service since 1941 can be considered to have received at least one dose; although most may have completed a primary series of tetanus toxoid, this cannot be assumed for each individual. Patients who have not completed a primary series may require tetanus toxoid and passive immunization at the time of wound cleaning and debridement.

Available evidence indicates that complete primary immunization with tetanus toxoid provides long-lasting protection — 10 years or more in most recipients. Consequently, after complete primary tetanus immunization, boosters — even for wound management—need to be given only every 10 years when wounds are minor and uncontaminated. For other wounds, a booster is appropriate if the patient has not received tetanus toxoid within the preceding five years. Antitoxin antibodies develop rapidly in persons who have previously received at least two doses of tetanus toxoid.

Td is the preferred preparation for active tetanus immunization in wound management of patients seven years old or older. This is to enhance diphtheria protection, since a large proportion of adults are susceptible. Thus, by taking advantage of acute health-care visits, such as for wound management, some patients can be protected who otherwise would remain susceptible. For routine wound management of children under seven years old who are not adequately immunized, DTP should be used instead of single-antigen tetanus toxoid. If pertussis vaccine is contraindicated or individual circumstances are such that potential febrile reactions following DTP might confound the management of the patient, DT may be used. For inadequately immunized patients of all ages, completion of primary vaccination at the time of discharge or at follow-up visits should be ensured.

If passive immunization is needed, human TIG is the product of choice. It provides longer protection than antitoxin of animal origin and causes few adverse reactions. The currently recommended prophylactic dose of TIG for wounds of average severity is 250 units IM. When tetanus toxoid and TIG are given concurrently, separate syringes and separate sites should be used. The ACIP recommends the use of only absorbed toxoid in this situation.■

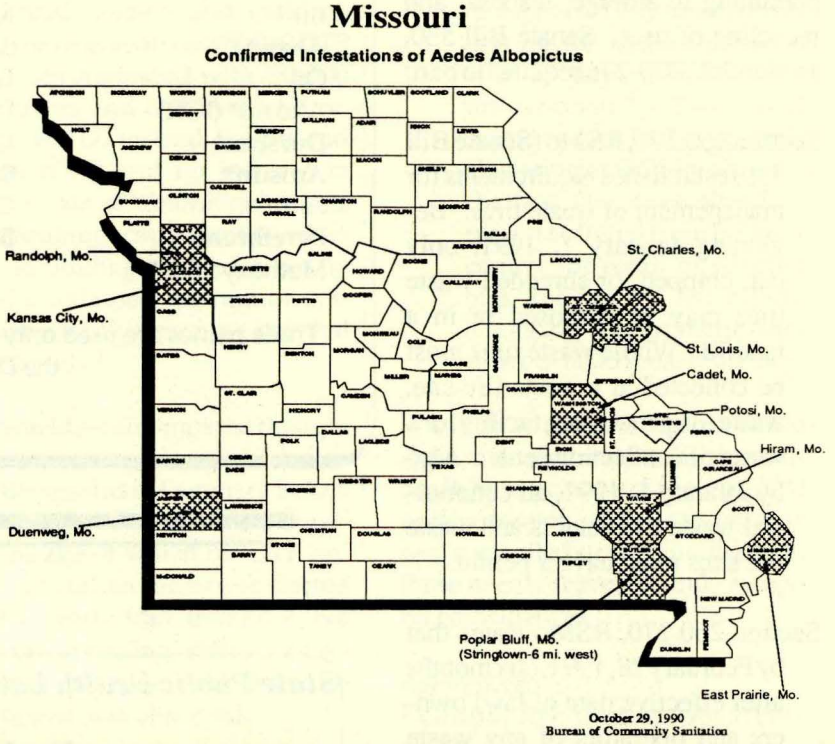
1990 *Aedes albopictus* (Tiger Mosquito)

Fred Unnewehr, Bureau of Community Sanitation

Three additional sites with tires infested with *Aedes albopictus* were discovered in Missouri during the 1990 season.

These sites were in the southeastern counties of Wayne, Butler and Mississippi. Previously, Southeastern Missouri was thought to be free of the "Tiger," but through efforts from the Southeastern District Office, Butler County Health Department, City of Poplar Bluff and Mississippi County Health Department in locating these additional scrap tire piles, the mosquito's presence was confirmed.

The map of Missouri on the following page shows the location of confirmed infestations to date.



Surveillance

The movement of vehicle tires throughout an area is the primary method that *Aedes albopictus* (tiger mosquito) is spread from one place to another and is the source of local infestations. They do, however, spread out into adjacent areas to other habitat when tires are eliminated during the breeding season or large infestations develop and some adults are forced to seek other artificial containers or tree holes for propagation.

According to a survey of different regions throughout the United States by the AMCA (America Mosquito Control Association), when asked to describe the most unusual breeding site, the list in Table A was developed.

Table A - Most Unusual Mosquito Breeding Sites

cemetery urns	tarp	bologna wrapper
sheet metal	bottle caps	Sara Lee cake pan
Coolwhip container	beer cans	PVC fitting
old engine block	toys	garbage cans
washing machines	tire rims	sheet plastic
broken larval dipper	wheelbarrow	margarine cup
old 5-gal. pesticide can	car parts	phono player case
lips of overturned bucket	inner tube	pool under air
discarded swimming pool liners		conditioner drain

It is plain to see that when litter, junk yards, refuse, etc., is prominent in infested areas, the spread of *Aedes albopictus* is inevitable and eradication efforts are diminished.

Control

A container breeding mosquito, such as *albopictus* provides us with a neat target for source reduction activities. This may be accomplished through 1) strictly enforced solid waste regulations; 2) recycling; 3) neighborhood cleanup days; 4) educational material distributed to the general public; and 5) source reduction literature distributed through the schools.

The chemical control products of choice for mosquito control agencies in areas of the United States infested by *Aedes albopictus* are listed in Table B. *cont'd...*

Legislation

During the 85th Missouri General Assembly, a new solid waste law was passed that contains a section pertaining to storage, disposal and recycling of tires. Senate Bill 530, section 260.270-276 requires in part:

Section 260.270, RSMo (Senate Bill 530) establishes requirements for management of waste tires. Beginning January 1, 1991, only cut, chipped, or shredded waste tires may be disposed of in a landfill. Whole waste tires must be collected at a waste tire site, waste tire processing facility, or a waste tire collection center. Also by January 1, 1991, all commercial waste tire haulers and waste tire sites must have a permit.

Section 260.270, RSMo states that by February 28, 1991, (six months after effective date of law) owners and operators of any waste tire site shall provide the Department of Natural Resources with information concerning the site's location, size, and approximate number of waste tires that have been accumulated at the site and shall initiate steps to comply with the law. By July 1, 1991, the department must promulgate rules regarding waste tire collection, storage, processing and transportation to include: methods of collection, storage and processing of waste tires; procedures for permit application and permit fees for waste tire sites and waste tire haulers; financial assurance requirements for waste tire sites; and exemptions.

Reference

AMCA (American Mosquito Control Association) Newsletter, Volume 16, Number 1, February 1990

Senate Bill 560 ■

Table B- Mosquito Control Products

Larvicides	Adulticides
Bti	Malathion (Cythion®)
Abate®	Scourge®
Oil	Dursban®
Altosid® (IGR)	Permanone®
Dursban®	Dibrom® (Naled)
Arosurf®	Sevin® (Carbaryl)
Salt	Cythion®/Resmethrin Mix
Pyrethrum	Baytex®
Methoxychlor®	

Trade names are used only to identify product not as endorsement by the Department of Health

State Public Health Laboratory News...

Newborn Screening -- Hypothyroidism, PKU, Galactosemia and Hemoglobinopathies

James Baumgartner, BS, MBA, Chief, Metabolic Disease Unit

	Jul 90	Aug 90	Total YTD
Specimens: Tested	9822	9990	70156
Initial (percent)	75.9	74.3	54678
Repeat (percent)	24.1	25.7	15478
Specimens: Unsatisfactory	203	205	1461
HT Borderline	132	144	549
HT Presumptive Positive	7	10	49
PKU Borderline	21	29	152
PKU Presumptive Positive			7
GAL Borderline	20	14	88
GAL Presumptive Positive		1	3
FAS (Sickle cell trait)	98	98	760
FAC (Hb C trait)	34	25	205
FAX (Hb variant)	14	19	89
FS (Sickle cell disease)		4	25
FSC (SC disease)	3		10
FC (Hb C disease)			3

Evidence for Pertussis Vaccine Safety Mounts

Reprinted from California Morbidity, State of California, Department of Health Services, July 27, 1990.

Evidence mounts against the thesis that whole-cell pertussis vaccine, the current pertussis component of DTP vaccine, can cause encephalopathy with permanent brain damage, epilepsy, or sudden infant death.

A. Epidemiologic Studies of DTP Vaccine and Encephalopathy/Epilepsy

1. Initial analysis of the British National Encephalopathy study, a case-control study, indicated an association between DTP immunization and rare instances of encephalopathy with permanent brain damage. However, reanalysis of the data revealed some classification errors that most of the few cases of brain damage that followed DTP were due to other causes or were cases of infantile spasms, which (as evidence from both this and other studies indicates) are not related to DTP.[1] Thus, no true association was found.

2. In a cohort study of 38,000 U.S. infants and children who received 106,000 doses of DTP vaccine, Walker et al found no increase in encephalopathy or epilepsy with onset shortly after DTP receipt beyond what would have been expected by chance alone.[2]

3. In a cohort study of 38,000 U.S. infants and children who received 107,000 doses of DTP, Griffin et al found no cases of encephalopathy, epilepsy, or other serious neurologic illness following DTP. Also, there was no significant increase in the rate of seizures in the week following DTP receipt over that for the control period of 30 days or more following immunization.[3]

4. In a cohort study of 134,000 British infants and children who received over 400,000 DTP doses compared with 133,500 infants and children who received DT instead, Pollock and Morris found no increase in the rate of neurologic events requiring hospitalization when case finding was performed by the unbiased method of systematically screening hospital records.[4]

5. Shields et al compared the ages of onset of epilepsy and infantile spasms in Denmark before and after that country lowered the age of which the DTP immunization series was started by nearly four months.[5] No corresponding shift in onset ages for these neurologic illnesses was observed.

B. Epidemiologic Studies of DTP and Sudden Infant Death Syndrome (SIDS)

1. Three case-control studies, one in the U.S. with 757 SIDS cases and 1,514 control infants,[6] one in France with 135 SIDS cases and 401 controls,[7] and one in Great Britain with 26 SIDS cases and 52 controls,[8] all found no positive association between DTP receipt and SIDS.

2. In a cohort study of 130,000 U.S. infants, Griffin et al found no increase in the incidence of SIDS in the week following receipt of DTP compared with that for the control period of over 30 days after DTP immunization.[9] Two small studies which had suggested a clustering of SIDS incidence in the first few days after DTP receipt suffered from failure to control for recall or selection bias and/or for the rapidly changing age-specific incidence of SIDS in early infancy.[9]

In conclusion, while serious neurologic disease and sudden infant death have occurred following DTP vaccine receipt, evidence to date from well controlled studies indicates that these events represent only temporal coincidences.

References

1 Griffith AH: Vaccine 1989;7:199-210.

2 Walker AM, et al: Pediatrics 1988;81:345-9.

3 Griffin MR, et al: JAMA 1990;263:1641-5.

4 Pollock TM, Morris J: Lancet 1983;1:753-7.

5 Shields WD, et al: J Pediatr 1988;113:801-5.

6 Hoffman HJ, et al: Pedatr 1987;79:598-611.

7 Flahault A, et al: Lancet 1988;1:528-33.

8 Taylor EM, Emory JL: Lancet; 2:271.

9 Griffin MR: New Engl J Med 1988;319:618-23. ■

CDC Influenza Public Information Hotline

(404)332-4555

This is a prerecorded message containing information on influenza activity in the United States by geographic region.

While it is geared primarily toward the general public and media, physicians, local health agencies and other officials may find it useful.

Reading and Interpreting Food Labels

John G. Norris, Bureau of Community Sanitation

Food labeling can be somewhat confusing to the average consumer. Most of the confusion has been created by allowing health messages or claims to be used by industry. About five years ago, the federal government started allowing these health messages to be used.

Every food in packaged form placed in a self-service display must bear the following information on its label:

(A) The common and/or usual name of the product or the name under which a standard of identity has been adopted;
(B) the name, address and zip code of the manufacturer, packer or distributor;
(C) the net contents or net weight of a package (this information is to appear in the lower 30 percent of the label);
(D) a list of ingredients in the order of their predominance by weight; and
(E) if preservatives, artificial colors or flavors are used, they must be declared.

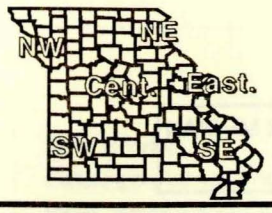
Today we find more consumers reading labels. Following is an explanation of terms and statements commonly used by the food industry for labeling of products:

(A) **No cholesterol** - a food labeled no or low cholesterol may still contain saturated fats that will raise blood cholesterol; this does not mean "no fat".
(B) **Sodium-free** or **Salt-free** - no more than 5 mg. sodium per serving.
(C) **Very low sodium** - no more than 35 mg. sodium per serving.
(D) **Low Sodium** - no more than 140 mg. sodium per serving.
(E) **Grade** - Many fruits, vegetables and honey products carry a "grade" on the label, such as "Grade A". These are not based on nutritional value. Milk and milk products carry a "Grade A" label. This grade is based on Food and Drug Administration recommended sanitary standards for the production and processing of milk and milk products which are regulated by the states. The grade is not based on nutritional value.
(F) **Organic** - No synthetic fertilizers or pesticides were used in growing, processing or packaging the food.
(G) **Natural** - Food products can be labeled "Natural" by food processors; however, this does not make the product more healthful. When this term is used on meat and poultry products, it only means that no artificial flavors, colors, preservatives or synthetic ingredients are being used.
(H) **Dietetic** - A product which has one or more of the ingredients (mainly sugar or sodium) substituted, changed or restricted. Therefore, this product may not be low in calories.
(I) **Reduced Calories** - A food product that is 1/3 fewer calories than the product it most resembles, while in meat and poultry it must contain 25 percent fewer calories.
(J) **Enriched** - Usually means the addition of vitamins B^1, B^2, B^3 and iron to refined grains, which is used to replace nutrients lost in the manufacturing process.
(K) **Lite** - May refer to any of the following - color, taste, texture, calories, weight.
(L) **Serving Size** - This means that the amount listed as the serving size is considered a reasonable serving for an adult (2 ounces, 1 slice, 1/2 cup, etc.).

Often you may notice a food does not have an ingredient statement. The reason is that the food complies to a written "standard of identity" which defines composition and name of the food. These standards are designed to prevent adulteration and mishandling by defining what a food is by establishing what you receive each time you purchase this food. Currently, there are over 200 standardized food products offered for sale to the consuming public. Some examples are cheeses, jams, peanut butter, mayonnaise, etc.

The Food and Drug Administration is currently proposing to revise the list of required nutrients and food components in nutrition labeling to add calories from fat, and amounts of saturated fatty acids, cholesterol and dietary fiber. This proposal is based on several scientific reports which recommend that Americans reduce their intake of total fat as well as their intake of saturated fatty acids and cholesterol and to increase intake of dietary fiber.

We hope that food labels are providing the public with information needed to make alert consumers, creating an understanding of what is being purchased and how to use the products. Labels can help protect the health and money of the consuming public. Please make it a habit to read all food labels carefully. If you have questions about food labeling, please contact your local health department or the Bureau of Community Sanitation at 314/ 751-6090. ■



Missouri Department of Health
Disease Prevention - Communicable Disease Control

BIMONTHLY MORBIDITY REPORT

Reporting Period *
September & October, 1990

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	2 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					1990	1989	FOR 1990	FOR 1989	5 YR MEDIAN
Vaccine Preventable Dis.																
Chickenpox	101	22	37	40	69	54	0	0	0	12	0	335	304	9370	7128	6876
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Influenza	1	0	0	0	0	0	0	0	0	0	0	1	1	217	246	72
Measles	0	0	0	0	0	0	0	0	0	0	2	2	85	100	451	31
Mumps	1	1	1	2	0	0	0	0	0	0	0	5	8	56	62	27
Pertussis	7	4	9	1	2	0	0	5	5	4	1	38	16	107	118	29
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	2
Viral Hepatitis																
A	19	0	2	14	12	3	0	15	4	11	4	84	121	429	621	263
B	20	12	10	4	4	13	0	19	17	12	6	117	107	511	580	369
Non A - Non B	3	0	0	1	2	1	0	2	1	2	0	12	14	54	44	37
Unspecified	0	0	0	0	0	0	0	0	0	0	0	0	3	20	8	15
Meningitis																
Aseptic	13	3	8	3	8	9	0	4	0	11	8	67	60	197	189	126
H. influenza	2	0	1	0	0	1	0	2	0	1	1	8	13	74	75	92
Meningococcal	2	0	0	0	1	2	0	1	1	0	0	7	4	30	16	29
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enteric Infections																
Campylobacter	10	1	13	9	7	10	0	4	2	16	13	85	95	470	433	262
Salmonella	18	4	22	22	38	23	0	22	8	20	50	227	123	635	584	584
Shigella	8	4	8	7	9	1	0	21	3	5	1	67	56	223	368	350
Typhoid Fever	0	0	0	0	0	1	0	0	0	0	0	1	0	4	2	3
Parasitic Infections																
Amebiasis	0	0	0	0	4	1	0	0	0	0	2	7	3	21	13	23
Giardiasis	42	12	38	15	17	24	0	14	0	32	11	205	188	700	711	510
Toxoplasmosis	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	16
Sexually Transmitted Dis.																
AIDS	8	0	4	2	4	10	6	17	59	30	0	140	99	474	344	164
Gonorrhea	120	12	95	87	44	34	0	1040	1820	666	49	3967	4683	17290	17438	15774
Genital Herpes	36	6	33	20	11	37	0	116	104	187	38	588	376	2779	1805	1420
Nongonoc. urethritis	49	5	31	31	2	1	0	294	820	287	1	1521	1210	6675	5863	6423
Prim. & Sec. syphilis	2	0	4	4	1	1	0	28	13	5	0	58	29	216	124	103
Tuberculosis																
Extrapulmonary	1	0	0	1	1	0	0	3	1	1	0	8	8	33	38	41
Pulmonary	2	3	6	5	5	2	3	5	5	13	0	49	31	234	169	198
Zoonotic																
Animal Bites	143	36	69	117	95	105	0	0	1	272	0	838	881	4716	3875	2198
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1
Rabies (Animal)	1	0	1	0	1	2	0	1	0	1	0	7	8	28	56	53
Rocky Mtn. Sp. Fever	0	1	0	2	3	0	0	0	0	1	0	7	5	34	47	23
Tularemia	0	1	2	2	2	0	0	0	0	0	1	8	4	29	32	32

Low Frequency Diseases

Anthrax
Botulism
Brucellosis
Chancroid
Cholera
Cryptosporidiosis
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 1
Legionellosis - 9
Leptospirosis
Lymphogranuloma Venereum - 1
Malaria - 3
Plague
Rabies (human)
Reye's Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome
Trichinosis

Outbreaks

Foodborne/Waterborne - 2
Histoplasmosis
Nosocomial - 2
Pediculosis
Scabies - 3
Other - 3

*Reporting Period Beginning Sept. 2, 1990, Ending Nov. 3, 1990

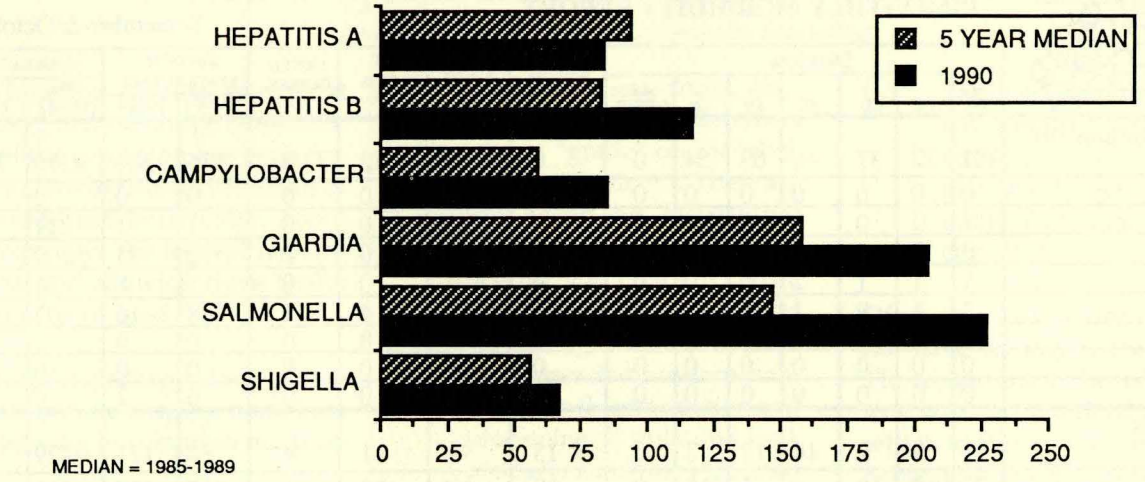
**Totals do not include KC, SLC, SLCo, or Springfield

***State and Federal Institutions

Due to data editing, totals may change.

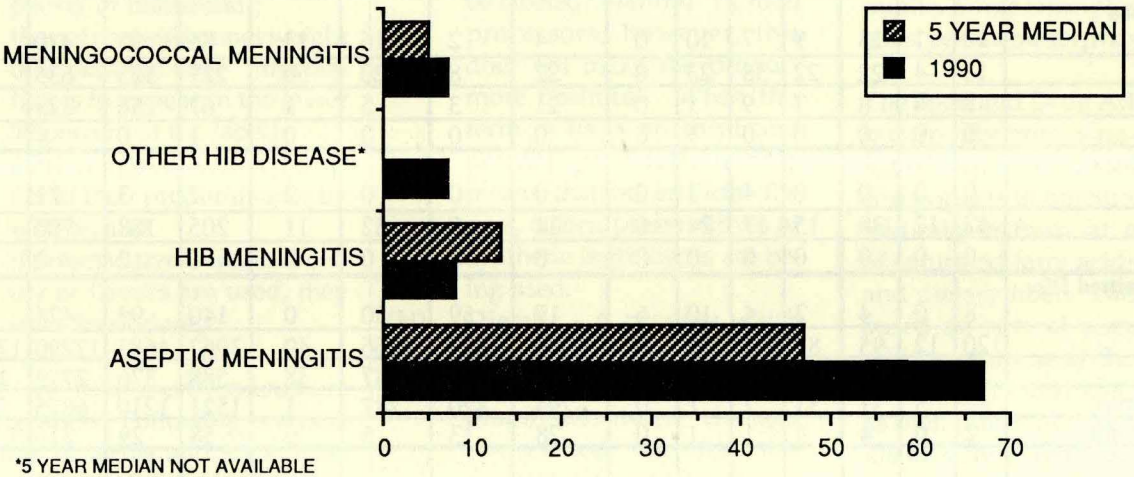
TEAR OUT FOR FUTURE REFERENCE

DISEASE REPORTS, SEPT/OCT
1990 VS. 5 YEAR MEDIAN



MEDIAN = 1985-1989

DISEASE REPORTS, SEPT/OCT
1990 VS. 5 YEAR MEDIAN



*5 YEAR MEDIAN NOT AVAILABLE
MEDIAN=1985-1989

Enteric infections and parasites were up for the months of September and October, 1990. Campylobacter, Salmonella, Shigella, and Giardia are above the five year medians for the months of September and October. Hepatitis B was also above its five year median for the same time period. Hepatitis A incidence decreased compared with the five year median.

Meningitis reporting for the months of September and October, 1990 has increased. Meningococcal meningitis and aseptic meningitis were above the five year medians for September and October. Hib meningitis was down. No five year median is available for Other Hib disease, since reporting just began in 1990.

Analysis of the year-to-date numbers (weeks 1-44) for all of the above diseases show that Campylobacter, Salmonella, aseptic meningitis, and Meningococcal meningitis were up in 1990 compared with last year. Hepatitis A, Hepatitis B, Giardia and Shigella are down from last year. All of the diseases named in this report were above the five year medians for weeks 1-44 except for Shigella and Hib meningitis.

Readership Survey

Dear Reader:

Please give us your opinion. We'd like to know if you find the *Missouri Epidemiologist* interesting and informative. With your input, we can make it more valuable. Please complete and return this survey by ***January 31, 1991.***

How many of the articles do you read in each issue of *Missouri Epidemiologist*?

❑ almost all ❑ more than half ❑ less than half ❑ none

Rank the following article subjects as: 1) Excellent 2) Good 3) Fair 4) Poor

❑ Outbreak Summaries

❑ Environmental Concerns

❑ Conferences/Training Calendar

❑ Reprints from other literature

❑ State Health Lab Report

❑ Bi-Monthly Statistical Report

❑ Outside Contributions

❑ Revisions to Program Guidelines

Please rate the newsletter on each of the following attributes:

	Excellent	Good	Fair	Poor
Your overall opinion	❑	❑	❑	❑
Writing style	❑	❑	❑	❑
Ease of reading	❑	❑	❑	❑
Appearance	❑	❑	❑	❑
Accuracy of information	❑	❑	❑	❑

Articles are generally ❑ too long ❑ too short ❑ just right

I would like to see the following topics covered in future issues:

_____

_____

_____

Would you pay a nominal fee to continue to receive the newsletter?

❑ Yes ❑ No

Is there a regular feature you would like to see?

_____

You are receiving this newsletter in your capacity as:

_____

Return Survey to: *Missouri Epidemiologist*
1730 East Elm, P.O. Box 570
Jefferson City, MO 65102-0570

TEAR OUT FOR FUTURE REFERENCE

Collection of Reference Sera from Human Lyme Disease Cases

CDC is continuing its efforts to obtain large volumes (i.e., 50-250 ml) of serum or plasma from patients with clinically well-characterized Lyme disease who have high-titer antibodies to *B. burgdorferi*. These immune sera are needed to standardize serologic test kits currently on the market, to evaluate new kits before they are marketed, to establish a nationwide laboratory proficiency program for serologic testing and to develop improved diagnostic test methods. Funds are available from CDC to reimburse patients, physicians, and blood banks for the donation and acquisition of these sera. Clinicians willing to acquire and submit sera should contact Dr. Robert Craven or Dr. Roy Campbell for details at (303) 221-6400.

Farewell:

Dear Readers: This is my last issue as Managing Editor of the Missouri Epidemiologist after having produced the newsletter since its inception in 1977. I hope you have found the articles beneficial and will continue to support public health activities.

I encourage you to complete the survey on page 15 and return your suggestions to enable the new editorial committee to provide you the latest information for epidemiology and environmental health. It has been a pleasure to serve you.

Sue Heisler

Missouri EPIDEMIOLOGIST

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Missouri EPIDEMIOLOGIST

Special Annual Report - 1989 *June 1990*

Annual Communicable Disease Report - 1989

Michael Fobbs, Bureau of Communicable Disease Control

The advent of databases and the increasing sophistication of data management systems has allowed an expansion in the timeliness and completeness of disease reports. This sensitivity should and does encourage public health officials to analyze the information and extrapolate about disease trends in the state. These extrapolations are based in part on changes in disease over time through comparisons of current numbers with the five year median.

ENTERICS

The increasing incidence of these diseases may reflect changes in childcare systems as well as a change in the sophistication of detection and reporting systems.

Campylobacter showed a modest increase of seven percent from 1988 to 1989. Increases in the Central, Eastern and Southwestern Districts were offset by decreases in the Northwestern and Southeastern Districts. Campylobacter is 68 percent above its five year median of 281 cases, with 473 cases reported in 1989.

Salmonella and shigella showed decreases for the period from 1988 to 1989. There were 676 cases of salmonella in 1989 compared to 690 cases in 1988. *S.virchow* was fourth on the list of common serotypes in 1988 but is not listed in 1989 (see Table 1). *S. virchow* is not a common serotype, so this probably reflects a return to baseline following the 1988 *S. virchow* outbreak in the Southwestern District.

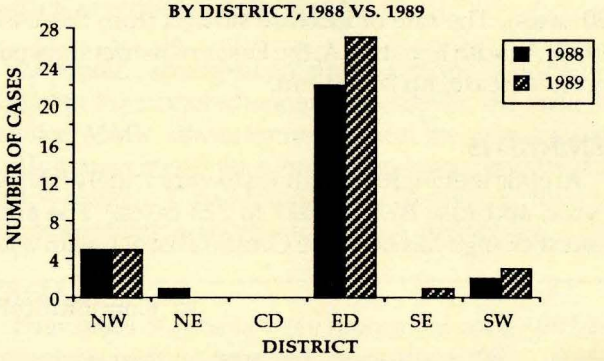
Table 1
Salmonella - 1989
Eleven Most Frequent Serotypes

Typhimurium	179
Heidelberg	92
Enteritidis	38
Hadar	33
Newport	31
Agona	18
Infantis	16
Montevideo	16
Bareilly	16
Thompson	12
Braenderup	12

Shigella, at 411 cases in 1989, is down 32 percent from the 1988 total but still 68 percent above the five year median of 244 cases. The Northeastern and Northwestern Districts showed increases of 233 percent and 227 percent from 1988 to 1989. All other districts showed decreases.

Yersinia enterocolitica increased in 1989 by 20 percent (30 cases to 36 cases) continuing a three year trend of increases. It is presently 500 percent above the five year median (six cases). *Yersinia enterocolitica* is a rare disease in Missouri and the small number of cases make it difficult to characterize, but 61 percent of cases are preschool children (See Figure 1) and 75 percent are located in the EasternDistrict. It appears to be following the age pattern shown by other diseases with a fecal-oral mode of transmission.

Figure 1
YERSINIA CASES IN MISSOURI
BY DISTRICT, 1988 VS. 1989



Inside this issue...

PARASITES

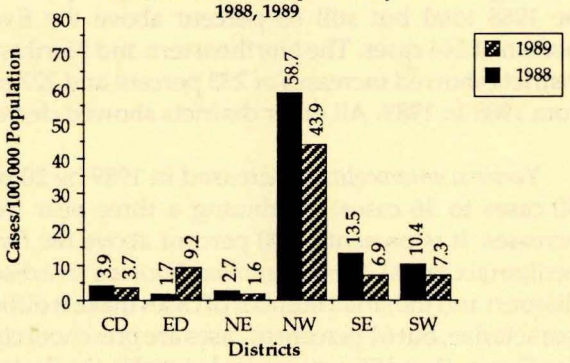
Giardia lamblia showed the largest increase of the enteric parasites with a rise of 31 percent. The Central and Eastern Districts showed the largest rises of 68 percent and 84 percent. Giardia is 66 percent above the five year median.

VIRAL HEPATITIS

Hepatitis A incidence decreased in 1989 following a three year rise. This decrease of 10 percent (down from 897 cases to 810) is still 486 percent above the five year median of 138. All districts except Eastern showed a decrease from 1988 to 1989 (See Figure 2). Cases in Eastern District increased by 437 percent (from 32 to 172).

Figure 2

Incidence Rates for Hepatitis A by District 1988, 1989



Hepatitis B continues its five year increasing trend. The increase for 1989 (639 to 704 cases) was 10 percent and showed a total rise of 68 percent over the five year median (420 cases). The rate of increase slowed from the 1987-88 period. As with hepatitis A, the EasternDistrict showed the largest increase, up 26 percent.

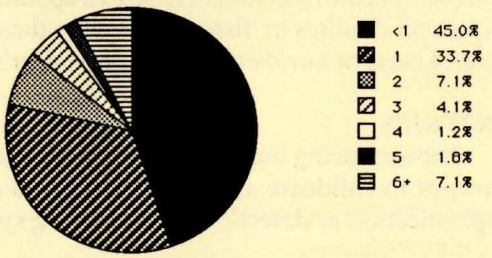
MENINGITIS

Aseptic meningitis continues to vary widely from year to year, and rose 80% in 1989 to 223 cases. The area of greatest change has been the Central District, with a jump from 4 to 22 cases. The long term trend has been an increase in the number of cases; the 1989 total is 43 percent above the five year median of 156 cases.

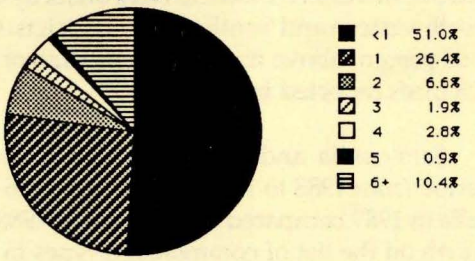
Haemophilus influenzae type B (Hib) meningitis has decreased by 23 percent from 1988, with 106 cases in 1989. It is down 23 percent from the five year median of 138 cases. This downward trend does not necessarily reflect the impact of the vaccine administered at 18 months. Of the affected individuals, 50 percent are less than 12 months and 77 percent are two years old or younger. A CDC grant was received in 1986 to do active hospital-based surveillance for bacterial meningitis. This project established a baseline of 172 Hib meningitis cases in 1986. It is quite possible that reporting has not been as complete since that time. The age distribution of the cases has not changed appreciably since 1986 (See Figure 3). ■

Figure 3

Haemophilus influenzae type b Meningitis Cases by Age, 1986



Haemophilus influenzae type b Meningitis Cases by Age, 1989



27 Communicable Disease Outbreaks, By Type, 1989

	Camp	College	Water	DayCare	Grocer	Restaurant	School	Unknown	Total Cases
Campylobacter						1			78
C.perfringens							1		18
Cryptosporidiosis				1				7	
E.coli 0157:H7			1						240
Gastroenteritis	1	1				4	2		229
Giardiasis				7					87
Hepatitis A		1						1	14
Salmonella						1			17
Shigella				1		1			19
Staph aureus					1				08
Probable viral	1								79
Viral Meningitis				1					06
#Outbreaks	2	2	1	10	1	7	3	1	
# Cases	177	53	240	104	8	164	45	11	802

Vaccine-Preventable Diseases - 1989

Lisa Speissegger, Marilyn Kemna, Bureau of Immunizations

Several major increases in the number of cases of vaccine-preventable diseases were closely monitored this year. New approaches to control and to prevent these diseases will be needed in the following year.

MEASLES

During 1989, Missouri reported 671 cases of measles, an increase of 923.3 percent over the 65 cases reported during 1988. This increase is consistent with the experience of neighboring states as well as the nation.

The incidence among school-age children (5-19) accounted for 73.4 percent of the cases, while 12.7 percent were reported in the adult (20+) population. The balance of cases occurred in the less than 1 - 4 age group.

During the year, five major outbreaks were reported that involved various populations and accounted for 620 cases (92.4 percent). Of these 620 cases, 468 (69.7 percent) occurred in persons who were not immunized with measles-containing vaccine. While cases continued to occur in the general public, the two groups with the largest number of cases involved the Amish and Christian Scientists communities. One death occurred as a consequence of measles disease in the Amish community.

Stricter outbreak control methods were implemented during the first outbreak in Blue Springs. These new methods involved administering a second dose of measles-containing vaccine to all persons exposed who did not have evidence of two doses of vaccine after twelve months of age. These new methods seem to have curtailed major outbreaks and will continue to be utilized during the next year.

PERTUSSIS

During 1989, 141 cases of pertussis were reported compared to 25 during 1988, an increase of 464 percent.

Of the cases reported, 88 (62.4 percent) involved children less than 1 year of age. The peak season during which the cases occurred was June through August. The two major metropolitan areas of Kansas City and St. Louis continue to have the highest incidence of pertussis.

Major emphasis on improving infant immunizations is planned for 1990 by enforcement of the Day Care Law (RSMo 210.003 — Supp 1988) and by increasing public awareness through the mailout of informational packets to new parents.

TETANUS

During 1989, four cases of tetanus were reported, compared to 1 case during 1988, an increase of 300 percent. Of the cases reported in 1989, all occurred in persons over the age of 70. One death occurred due to consequences of tetanus infection.

Increased efforts to promote adult immunization will be implemented by increasing public awareness of vaccine-preventable diseases in this age group. A major public information kick-off is anticipated during Adult Immunization Week, October 22-26, 1990.

MUMPS

A total of 87 cases of mumps were reported in 1989 compared to 68 cases during 1988, representing a 27.9 percent increase in cases. The incidence of the disease primarily occurred in school-age children.

At present, mumps-containing vaccine is not a requirement for school attendance, however, the vaccine of choice, MMR, administered to meet the measles and rubella requirements for school attendance contains the mumps antigen. Consideration will be given to require mumps-containing vaccine for school attendance.

RUBELLA

Four cases of rubella were reported during 1989, in comparison with no reported cases since 1987. These cases were identified through serologic screening during investigation of measles outbreaks. No reported spread of disease occurred.

In response to this dramatic increase, further efforts in ensuring that a majority of children in the state of Missouri receive MMR vaccine will be conducted through enforcement of the School Immunization Law (RSMo 167.181 — 1988). ■

1989 Sexually Transmitted Diseases

Ray Bly, Chief, Bureau of Sexually Transmitted Diseases

Early Syphilis

(Primary, Secondary and Early Latent under one year)

The reported incidence of early syphilis remained essentially the same in 1989 compared to 1988 with a decrease of five cases. Primary and Secondary cases increased (five percent) from 154 in 1988 to 162 cases in 1989. Early latent cases decreased 13.1 percent from 112 cases in 1988 to 99 in 1989. Kansas City reported 92 primary and secondary cases and 41 early latent cases or just slightly over half of the early syphilis cases reported in Missouri. The majority of the Kansas City cases continue to be reported around crack-cocaine using areas where increases have also been noted in other sexually transmitted diseases.

The primary and secondary rate of 3.2 per 100,000 population in Missouri is considerably lower than the rate of 17.2 per 100,000 population reported nationally in 1989.

Gonorrhea

The reported incidence of gonorrhea increased in Missouri from 17,241 cases in CY 1988 to 21,053 in CY 1989. This is an increase of 3,812 cases or 22.1 percent and the rate increased from 335.4 per 100,000 in 1988 to 421.0 per 100,000 in 1989. St. Louis City reported an increase of 2,568 cases, St. Louis County 1,127, Kansas City 473 and Outstate Missouri reported a decrease of 356 cases.

This is the second consecutive year in which an increase in gonorrhea has been reported after six years of decreasing incidence.

Penicillinase-producing N. gonorrhoeae (PPNG)

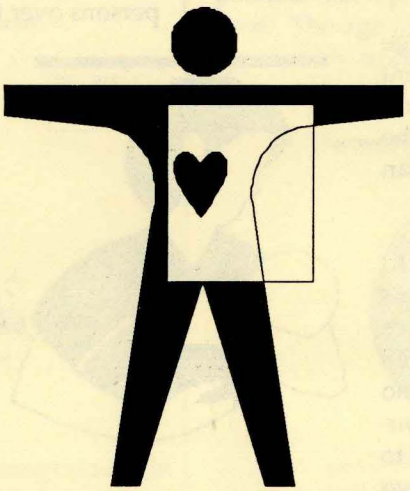
Resistant gonorrhea increased 77.7 percent from 229 cases reported in 1988 to 407 cases in 1989. Kansas City accounted for 317 of the 407 total cases; St. Louis City accounted for 40; St. Louis County reported 31 and outstate Missouri accound for 19 cases.

Gonococcal Pelvic Inflammatory Disease (GPID)

GPID decreased from 756 cases reported in 1988 to 625 cases in 1989. This decrease occurred in all areas of the state except for Outstate Missouri. St. Louis City and County reported a decrease from 444 cases in 1988 to 409 cases in 1989. Kansas City reported a decrease from 253 cases in 1988 to 131 cases in 1989, Outstate Missouri reported an increase from 59 cases in 1988 to 85 cases reported in 1989.

Chlamydia Trachomatis Infections

Chlamydia trachomatis infections increased 30.6 percent from 6,239 cases reported in 1988 to 8,151 cases reported in 1989. The reported incidence of *Chlamydia trachomatis* infection has increased each year since it was designated as a reportable infection in March of 1986 when 1,532 cases were reported. These increases are occurring because of increased testing and reporting . Based on the limited chlamydia testing done during the last three years, chlamydia is believed to be much more prevalent than gonorrhea and is expected to continue to increase in public clinics and the private medical community as testing is expanded.



Non Gonococcal Urethritis (NGU)

Reported cases of NGU decreased from 7,606 cases in 1988 to 6,690 cases in 1989. This decrease occurred in all areas of the state with the exception of St. Louis County. This is the second consecutive year in which a decline has occurred believed to be the result of more testing and diagnosis of *Chlamydia trachomatis* infections.

Genital Herpes

Genital Herpes changed very little with 2,250 cases reported in 1988 to 2,283 cases in 1989. St. Louis City, St. Louis County and Kansas City reported slight decreases in cases reported and Outstate Missouri reported an increase of 160 cases.

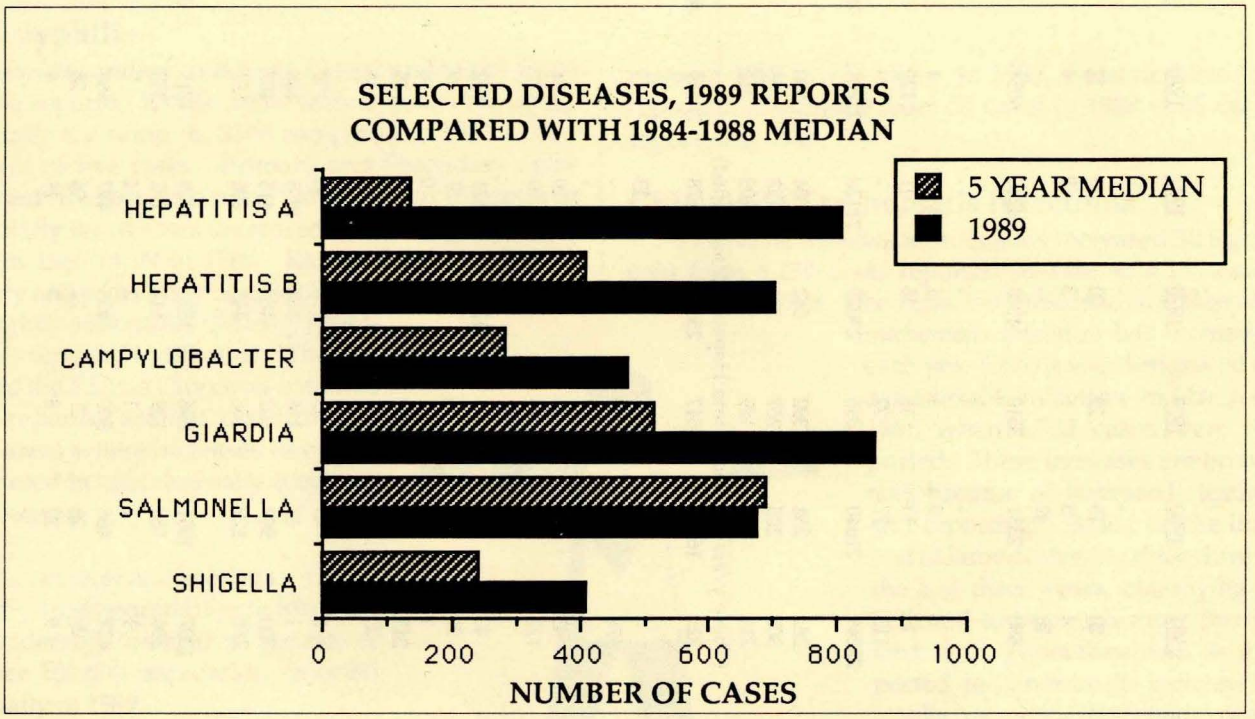
Congenital Syphilis

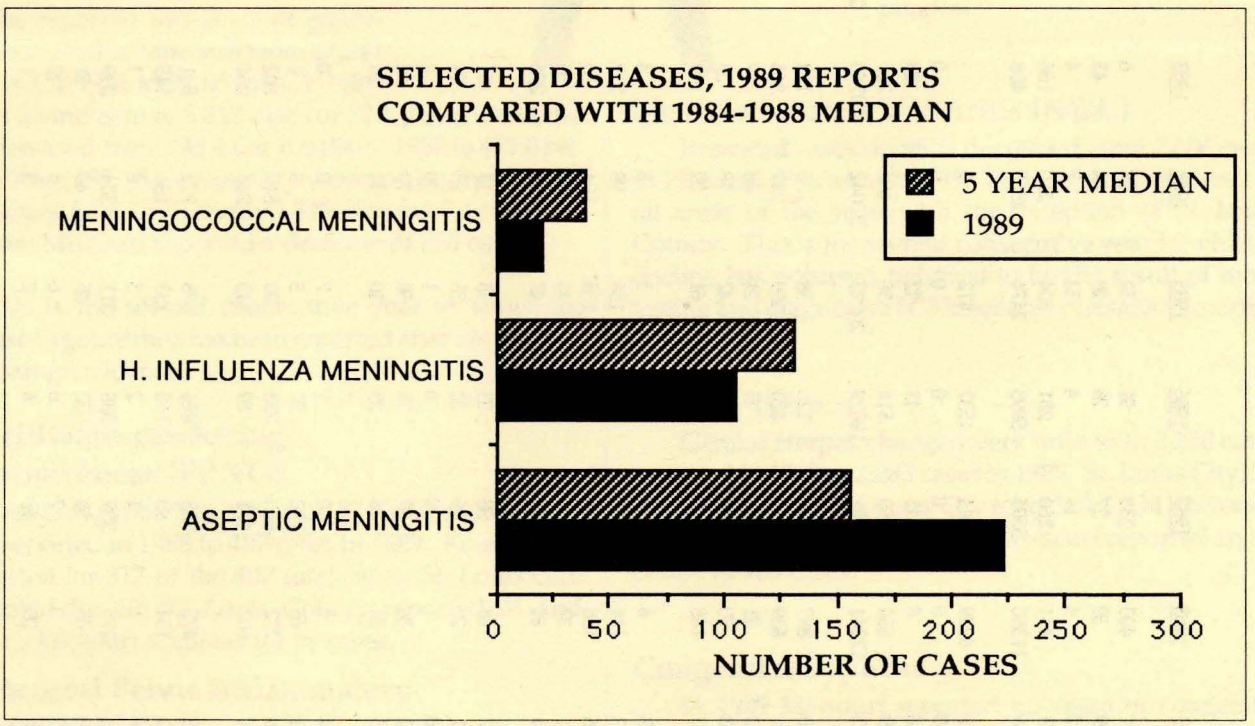
In 1989 Missouri reported no cases of congenital syphilis. This follows three consecutive years in which three cases were reported each year. Nationally, congenital syphilis has increased each year since 1983 when a rate of 3.5 cases per 100,000 live births was reported until 1989 when this rate increased to 23.8 cases per 100,000 live births. ■

Missouri Morbidity and Mortality Reports of Selected Communicable - 15 YEAR REPORT

	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975
AIDS	481	403	239	91	52	28	6	1	-	-	-	-	-	-	-
Amebiasis	19	30	27	26	28	44	45	11	28	15	29	20	10	12	14
Brucellosis	2	4	14	4	12	7	4	4	4	3	6	3	9	4	4
Campylobacter	473	441	260	281	304	260	166	115	78	49	-	-	-	-	-
Chickenpox	9086	11350	8595	5093	2474	2565	408	637	880	2331	3510	4048	4246	6051	7633
Chlamydia	8151	6239	2944	1532	412	9	-	-	-	-	-	-	-	-	-
Diphtheria	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0
Encephalitis, Inf.	6	8	11	13	12	11	28	16	10	13	16	16	11	129	82
Giardiasis	859	654	690	516	458	462	216	235	113	77	72	-	-	-	-
Gonorrhea	21053	17241	16491	19029	20023	20042	20750	21269	22249	21640	21395	23029	21126	21281	18346
Hepatitis A	810	897	560	126	98	138	123	204	282	254	392	552	504	560	542
Hepatitis B	704	639	460	420	359	297	365	297	307	205	267	231	233	196	254
Unspecified	13	21	21	15	24	46	87	95	214	176	189	192	205	242	220
Non A, Non B	53	50	46	39	42	18	33	24	(These years are added into Hepatitis Unspecified) ----------						
Influenza	293	148	69	78	61	39	140	153	225	16881	18647	25688	29178	28449	44367
Malaria	13	6	8	12	5	8	4	10	4	16	6	10	23	9	10
Meningitis, Asep.	223	124	163	172	156	95	277	156	178	116	130	-	-	-	-
Meningitis, H. Flu	106	138	131	172	108	104	86	66	-	-	-	-	-	-	-
Meningitis, Meng.	21	33	35	40	46	53	55	40	45	42	38	42	29	51	58
Meningitis, Other	64	64	75	123	47	51	276	156	122	127	94	92	89	122	93
Mumps	87	68	38	23	18	11	21	13	40	103	203	1211	2421	962	1027
Pertussis	141	25	46	32	35	23	24	17	24	30	24	45	31	19	21
Polio, all forms	0	1	0	0	1	0	2	0	1	0	1	0	0	0	0
Rabies Animal	62	36	59	75	59	70	96	123	243	379	307	95	60	75	50
RMSF	48	54	26	25	10	14	14	10	23	31	31	29	19	18	16
Rubella	4	0	0	1	7	0	0	38	2	45	73	118	93	139	758
Rubeola	671	65	190	32	5	6	1	2	1	67	436	154	1055	468	251
Salmonellosis	676	772	660	728	690	617	602	571	700	589	602	488	418	407	440
Shigellosis	411	607	471	89	143	244	264	67	268	129	258	443	406	157	172
Syphilis, Total	388	473	328	494	578	712	801	1069	1397	1051	896	1573	1728	1715	3762
Primary & Second.	162	154	90	110	133	186	145	296	394	163	139	144	172	353	277
Tetanus	4	1	1	2	3	6	1	1	1	2	1	2	4	2	2
Tuberculosis	278	275	339	338	311	354	399	390	432	466	500	456	497	568	550
Tularemia	39	45	58	32	35	40	51	27	28	26	21	21	26	28	17
Typhoid Fever	2	3	7	6	6	6	10	4	9	20	8	7	14	4	6
Yersinia	36	30	10	6	2	3	1	-	-	-	-	-	-	-	-

SOURCE: Bureau of Communicable Disease Control
800/392-0272





If you have questions or comments, please contact the Bureau of Communicable Disease Control at 800/392-0272

1989 Rabies Summary

F.T. Satalowich, D.V.M., M.S.P.H., Bureau of Veterinary Public Health

The Missouri State Public Health Laboratory confirmed 62 cases of animal rabies in 1989. This represents 2.5 percent of the 2437 animals tested and an 86 percent increase over the 36 cases in 1988. June and July were the peak months for submittal. April and September were the months of highest percent positive, 5.7 percent and 3.9 percent, respectively.

The reservoir of rabies in Missouri and the Midwest continues to be the skunk. Thirty-eight cases of skunk rabies were recorded in 1989, the same number as in 1987. This represents 61 percent of the total number of positive rabies cases and 1.5 percent of the total number of specimens examined. Of the 165 skunks submitted, 23 percent were positive for rabies. In 1988, 110 skunks were submitted with 16 percent being positive. Historically, 51 percent of skunk specimens submitted are positive.

Bats were the most frequently submitted wild animal (327). Of this total, 22 or (6.7 percent) were positive. Wild animals, bats and skunks, accounted for 97 percent of the total rabies cases. This follows the national rabies epidemiologic picture where 88 percent of rabies is attributed to wildlife species.

The rabies surveillance program is a passive system in Missouri and nationally. Despite the short-coming of such a system, a relatively good product is produced. Rabies is occurring throughout the state. Missouri is historically and presently considered endemic for rabies. Of the 114 counties in Missouri, only one county failed to submit a specimen. Four counties submitted only one specimen, six counties submitted only two specimens, and seven counties submitted only three specimens. All other counties, 84 percent, submitted adequate numbers of specimens.

The number of rabies cases reached its lowest point of the decade in 1988. Comprehensive active surveillance of the foci of skunk rabies in St. Francois county may show an epi center spread. The same might be said for the skunk activity in the northeast counties. A fallacy of conjecture is that all variables are not known. Population dynamics of the skunk in these areas is unknown and of utmost importance in the spread of animal rabies. Statewide skunk populations are becoming more difficult to estimate since the cost of skunk pelts are down and trappers are not hunting skunks. Thus the most valuable tool of determining skunk populations is not functioning. The State of Illinois reports extremely low populations of skunks and skunk rabies. Resources do not permit an active assessment of this epidemiological picture. Since the approach to rabies control and prevention would not change, resources are best expanded on methods of prevention and control rather than depicting the exact epidemiological picture.

An evaluation of bat rabies for the decade, shows that the number of cases has increased. Illinois bat rabies follows the same pattern. For the first half of the decade, there was an average of 16 cases per year. For the second half of the decade, there was an average of 15 cases per year.

The final assessment of rabies in Missouri can best be depicted by the statement "It is alive and well." Since the reservoir is well established in the wildlife population and methods of wildlife rabies control are indeed futuristic, the cardinal methods of rabies control remain:

1. Mandatory vaccination of dogs and cats to provide a buffer zone between the reservoir and man.
2. Stray animal control to prevent a vector system.
3. The prohibition of keeping wildlife species as pets since they are potential rabies carriers.

Counties and communities now have the authority to enact local rabies and animal control regulations. A Model Ordinance has been perfected by the Department of Health and is available for counties to utilize in tailoring an ordinance to meet their local requirements. ■

1989 Submissions for Rabies Examinations by Species

Species	# Tested	# Positive
Skunk	165	38
Fox	17	0
Bat	372	22
Raccoon	97	0
Dog	614	1
Cat	757	1
Bovine	59	0
Other	401	0
TOTAL	**2437**	**62**

1989 Submissions for Rabies Examinations by Month

Month	# Positive/# Submitted	% Positive
January	2/130	1.5%
February	2/91	2.1%
March	5/209	2.3%
April	11/183	5.7%
May	7/190	3.5%
June	5/334	1.5%
July	4/274	1.4%
August	9/257	3.4%
September	10/248	3.9%
October	1/180	.6%
November	5/130	3.7%
December	1/146	.6%
TOTAL	**62/2437**	**2.5%**

Rocky Mountain Spotted Fever-1989

Missouri recorded 48 cases of Rocky Mountain spotted fever (RMSF) in 1989. This is an 11 percent decrease from the 54 cases in 1988. The decade has seen an average of 25.5 cases per year. As in years past, the majority, 92 percent, occurred south of the Missouri River or in counties adjoining the river. Nationally, the prevalence of RMSF appears to have plateaued and/or decreased. In the south-central region, Arkansas, Texas, Oklahoma and Missouri, the prevalence has increased in recent years. Oklahoma had an incidence rate of 1.9/100,000 in 1989. Missouri with 48 cases had an incidence rate of just under 1/100,000.

Missouri followed the national pattern in age and sex distribution. Nationally 63.1 percent of the cases were male, in Missouri 58.3 percent were male. Age distribution ranged from two years to 91 years, with 22.9 percent of the cases occurring in children 10 years of age or younger.

The most frequent symptoms continue to be fever, headache, rash and myalgia. The case fatality rate nationally was 1.2 percent overall, being higher 1.5 percent for those ≥ 20 years of age and lower 0.6 percent for those <20 years of age.

Missouri had no human case fatalities in 1989. A morbidity-mortality case of RMSF was confirmed in a canine.

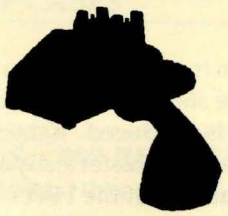
Because no laboratory test is consistently positive during the first two weeks of illness, patients with suspected RMSF should be treated empirically and serologic tests delayed until both acute and convalescent serum specimens are available. The indirect fluorescent antibody (IFA) and the indirect hemagglutination (IHA) tests are the most sensitive and specific of these tests. The Weil-Felix test should not be used because it lacks both sensitivity and specificity.

The best preventive measure is avoidance of tick-infested areas. Persons who must enter these areas should wear protective clothing and use repellants. Attached ticks should be removed by grasping them with fine tweezers at the point of attachment and pulling gently. When fingers are used instead of tweezers, they should be protected with facial tissue and washed afterwards. ■

Tularemia Case Reports Down in 1989

There were 39 cases of tularemia reported in 1989. This is a decrease of 33 percent from the decade high of 58 cases in 1987 and a 13 percent decrease from the 45 cases in 1988. Missouri has averaged 36.3 cases per year for the past 10 years. All but three cases occurred south of the Missouri River. These three cases were in counties bordering the river. Males continue to be at higher risk, accounting for 28 of the 39 cases (72 percent). Age distribution ranged from two years to 99 years, with six cases being 10 or under and five cases being 80 or over.

For further information about tick-borne diseases, please call your local health department or the Bureau of Veterinary Public Health, 314/ 751-6136. ■



Who Do you Call...

AIDS information HOTLINE	800/533-AIDS
or AIDS Prevention	314/751-6438
Community Sanitation consultation	314/751-6090
Radiological Health information	314/751-6083
Environmental Epidemiology	314/751-6102
Occupational Health inquiries	314/751-6102
DiseasePrevention consultation	314/751-6128
Communicable Disease consultation	314/751-6113
Veterinary Public Health/zoonotic	314/751-6136
Immunization information	314/751-6133
STD information	314/751-6141
TB information	314/751-6122

Environmental Health and Epidemiology

Toll-Free 800/392-0272

Bureau of AIDS Prevention— 1989 Year-End Report

In calendar year 1989, 481 new cases of AIDS were diagnosed in Missouri. Another 1,035 Missourians were found to be infected with the Human Immunodeficiency Virus (HIV), the virus that causes AIDS. Through late 1989, Missouri was ranked 19th among the states in the rate of growth of reported AIDS cases, and accounted for just over one percent of the nation's AIDS cases. Yearly, HIV reporting patterns indicate an increasing impact on Missouri's minority communities and an increase in new infections resulting from heterosexual transmission. These patterns are consistent with national trends.

Data on the extent of the epidemic in Missouri are collected through the bureau's surveillance and seroprevalence programs. Surveillance staff routinely contact hospitals and clinics looking for newly diagnosed infections and cases of "full blown" AIDS, review death certificates, and compile a registry of confirmed HIV-infected and AIDS cases. The Seroprevalence staff conduct blinded studies to measure the extent of HIV infection in all newborns and in samples of patients attending tuberculosis, IV drug, reproductive health, and STD clinics. This information helps the bureau develop strategies for prevention and care programs and is used by other agencies supplying care and services to persons with HIV/AIDS.

The AIDS Resource Center, which is maintained by bureau staff, is a clearinghouse for information and educational materials on HIV/AIDS. The center currently receives 66 journals and newsletters, has access to three on-line data bases, keeps a wide selection of books, pamphlets, videos and posters, and oversees the statewide Speakers Bureau. Materials and services are available at no cost to health professionals and the public. As a result of over 600 requests for educational materials in 1989, the AIDS Resource Center disseminated more than 99,000 pamphlets, 9,700 posters, 450 informational packets and 500 informational books for physicians.

The statewide Speakers Bureau filled requests for over 90 presentations on AIDS in 1989. These requests came from a variety of groups such as schools, hospitals, professional organizations and private industry.

The AIDS Bureau, directly and through contract with the St. Louis and Kansas City AIDS Programs, provides funding for health education/risk reduction activities. Community based organizations then disseminate AIDS prevention information to target populations at the local level. These organizations are involved in a number of initiatives including local hotlines, development of culturally specific educational materials, presentations to target audiences and the management of the Missouri AIDS Speakers Bureau.

The bureau has also been working with community based organizations and AIDS service organizations to survey minorities, women of childbearing age, youth, IV drug users, prostitutes, and gay/bisexual men about HIV/AIDS. Results of these surveys show a fairly high level of knowledge about AIDS transmission by most Missourians; however, a significant number of people have not changed their behavior to reduce their risk of infection.

Counseling and testing for HIV is an essential component of the program. The bureau, through contracts with local health departments and clinics, provides this service at 38 sites in Missouri. In 1989, 34,512 individuals were tested for the virus at these sites. During 1989, 57,458 blood specimens were analyzed free of charge at the state public health laboratory for counseling and testing sites, hospitals, clinics, and physicians.

In 1989 Missouri became the first state in the nation to develop and implement a statewide system of case management for persons with HIV infection. The program, HIV Care Coordination, provides assistance in locating, coordinating, expediting and monitoring medical and social services for HIV infected individuals at the least restrictive, more cost effective level feasible. Services are provided free of charge regardless of the client's income or insurance status by four regional teams of community health nurses and clinical social workers. Between March 1989 and December 1989 care coordination staff served 329 clients. The bureau anticipates a growing need for these services as the number of identified HIV/AIDS patients in Missouri increases.

The HIV Treatment Program pays for zidovudine (AZT) for those low income individuals who are not covered by private medical insurance and are ineligible for Medicaid. In 1989 zidovudine was purchased for 116 people at a cost of over $230,000.

The Medicaid Home and Community-Based services waiver for persons with AIDS, which is a part of HIV Care Coordination, became effective July 1, 1989. This joint initiative between the Departments of Health and Social Services allows medicaid to pay for services not currently available under their regular program. The four waiver services include private duty nursing, attendant care, transportation and supplies. Care coordination staff work with recipients who receive services in their home in lieu of hospital care at costs equal to or less than those they might otherwise incur. Between July 1, 1989 and December 31, 1989, 25 Missourians received waiver services.

An HIV/AIDS program would not be complete without the training of health professionals. The bureau, through an agreement with the Midwest AIDS Training and Education Center (MATEC) and the University of Missouri-Columbia, has offered programs to Missouri health professionals since late 1988. In 1989 the Missouri MATEC program sponsored or co-sponsored 35 programs which delivered over 14,500 contact hours of training on HIV/AIDS.

The bureau receives federal and state funding for these prevention and care programs. The total budget for 1989 was $4,544,047. Approximately $3,264,952 came from federal sources and was used for AIDS CDC surveillance and prevention activities. Approximately $1,279,095 came from general revenue and was used to support HIV Care Coordination and HIV serologic testing through the State Public Health Laboratory. ■

Tuberculosis in 1989: Concern Increases for 25-44 Age Group, AIDS Patients, and Inmates

Vic Tomlinson, Bureau of Tuberculosis Control

In 1989, 278 cases of tuberculosis were reported in Missouri for a case rate of 5.4 per 100,000 population. This represents an increase of three cases from the previous year.

The incidence of tuberculosis increased by 16.7 percent in the St. Louis County area while the number of cases decreased by 11.4 percent in Kansas City and remained the same in St. Louis City as the previous year. Tuberculosis increased by only two cases in the outstate areas of the state. Although the increase in the number of outstate cases is small, they represent a significant portion, 58.6 percent, of the total cases.

Overall, 67.3 percent of the cases in Missouri occurred among whites, 25.9 percent among blacks, and 6.8 percent among Asians. However, the incidence of tuberculosis is significantly higher among minorities in the major metropolitan areas. Specifically, in St. Louis City, 64.7 percent of the cases occurred among blacks and in Kansas City, 38.5 percent of the cases occurred among blacks. In St. Louis County and City the combined proportion of cases among blacks is 40.8 percent.

Tuberculosis is still found among older Missourians, but the proportion in the elderly has decreased somewhat in recent years. During 1989, 120 cases occurred among individuals 65 years of age or older. An increasing percentage of cases are occurring among younger individuals aged 25 to 44. In 1988, only 54 of the 275 cases, or 19.6 percent, occurred in the 25-44 age group. However, in 1989, 75 of the 278 cases, or 27 percent, occurred in the same age group.

During 1989, 29 foreign-born individuals were reported with tuberculosis in Missouri. Of this number, 65.5 percent were Asian, and 24.1 percent were Hispanic.

A significant increase was observed in the number of cases in correctional facilities. A total of 21 individuals were reported with tuberculosis from state and federal correctional centers. This represents an increase of 50 percent over 1988. Major epidemiological investigations were conducted in this group during 1988 and 1989.

An increasing concern is the association between AIDS and tuberculosis. In Missouri, the AIDS case register is compared to the tuberculosis case register in order to determine the proportion of tuberculosis patients with AIDS and certain characteristics of individuals with both conditions. This linking of the two registers has taken place on a monthly basis since late 1985. Of the 1,301 cases of AIDS reported among Missouri residents through 1989, 33 individuals also had a diagnosis of tuberculosis. In addition, there have been a total of 54 cases of mycobacterial disease other than tuberculosis reported among AIDS patients. The most common mycobacteria isolated from these individuals is the *M.avium* complex, which was isolated from a total of 42 patients, or 77.7 percent. ■

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